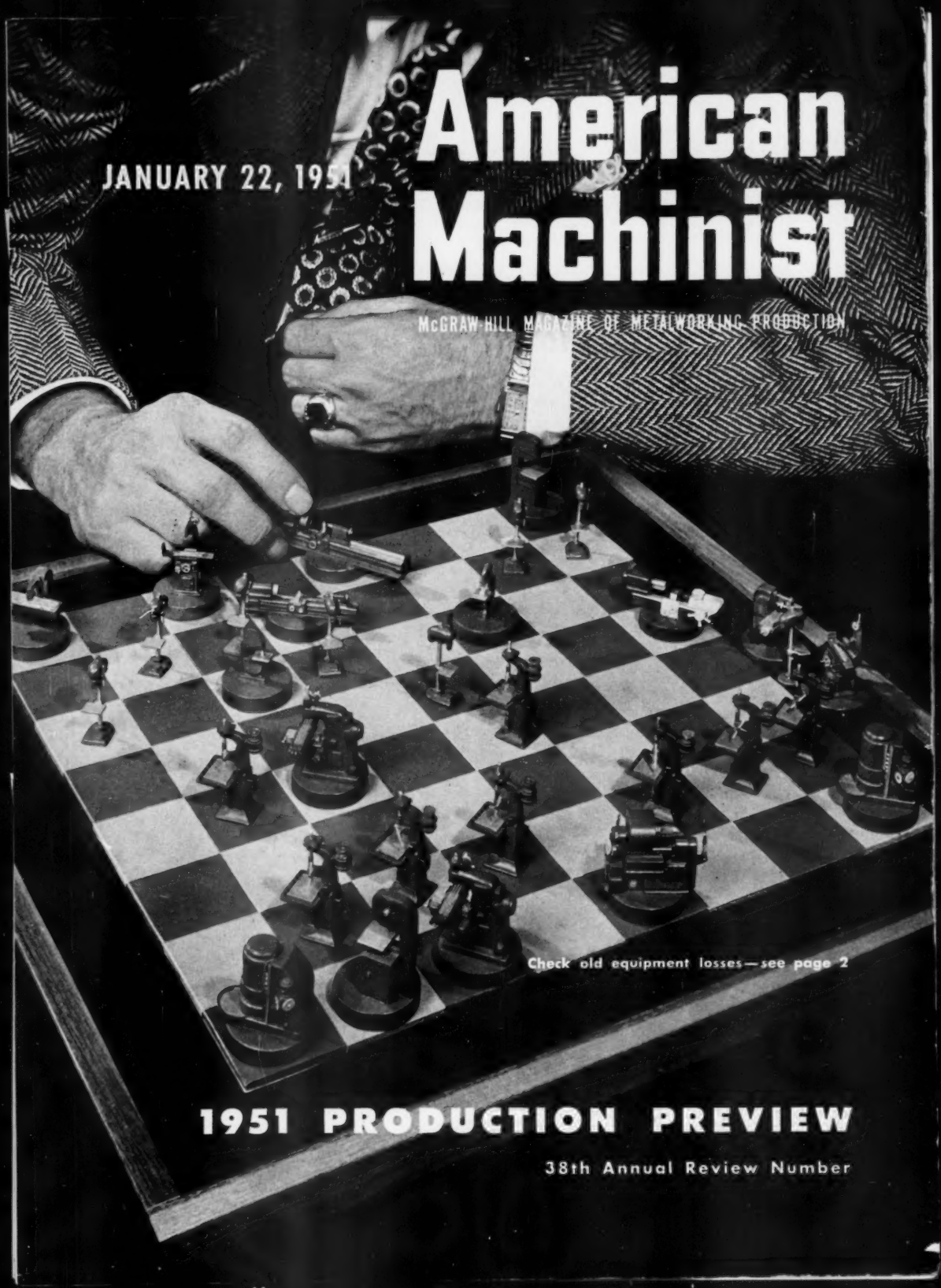


JANUARY 22, 1951

American Machinist

McGRAW-HILL MAGAZINE OF METALWORKING PRODUCTION

Check old equipment losses—see page 2

1951 PRODUCTION PREVIEW

38th Annual Review Number

new DOUBLE DUTY machine does internal and face grinding SIMULTANEOUSLY!

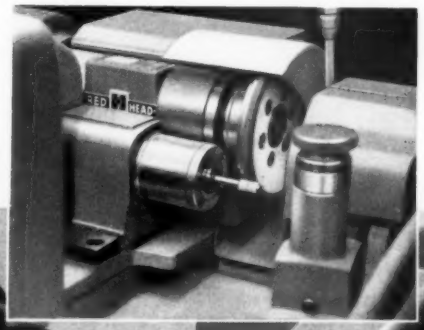
Roller production increased 35% with new Heald Size-Matic Internal arranged for simultaneous bore and face grinding

This unusual grinding application is a typical example of the versatility of Heald machines. A unique wheelhead arrangement permits the new Model 171 Size-Matic Internal to perform bore grinding and facing operations simultaneously—in the same time normally required for bore grinding alone. Savings in handling and cycling time boosted production by 35%.

The face grinding wheelhead, mounted on the wheelslide adjacent to the bore grinding wheelhead, is designed with enough free axial motion to permit the facing wheel to maintain a fixed position while the bore grinding wheel reciprocates. A coil spring holds the facing wheel against the hydraulically operated automatic facing stop.

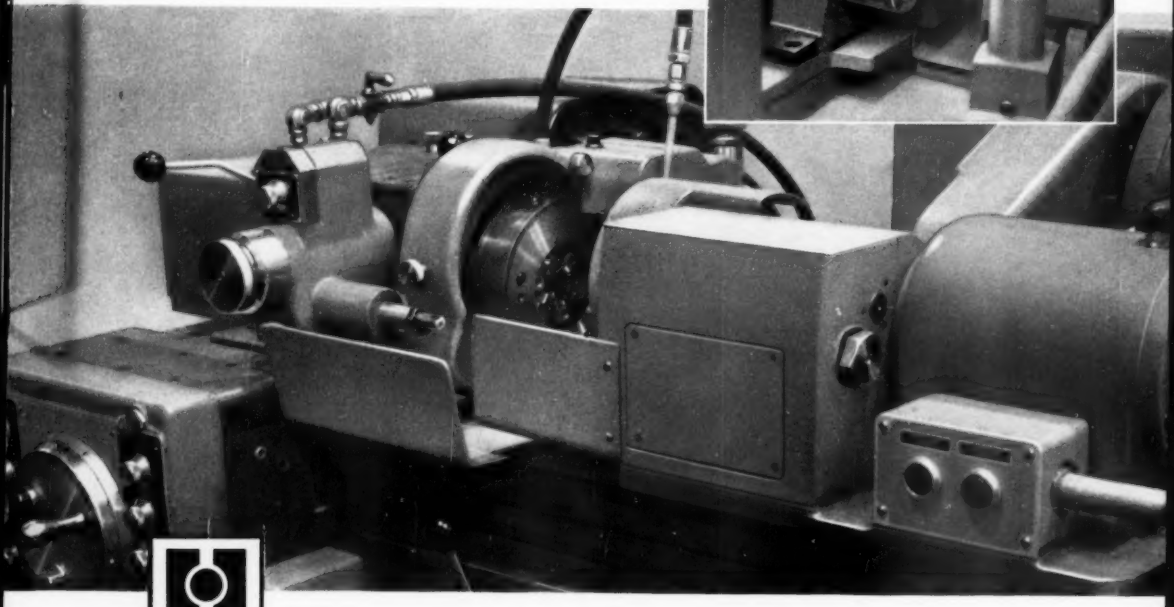
The facing operation is performed during the roughing part of the bore grinding cycle. During finish bore grinding, the facing wheel is automatically retracted, and can be dressed during this operation with no delay to the grinding cycle.

In addition to saving valuable time, this set up produces a ground face that is always perfectly square with the bore.



Close-up view from rear of machine, showing unique arrangement of bore and face grinding wheelheads.

The new Heald Model 171 Size-Matic shown below grinds face and I.D. of rollers simultaneously, reducing cycle and handling time by 35%.



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WORCESTER 6, MASSACHUSETTS

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American Machinist

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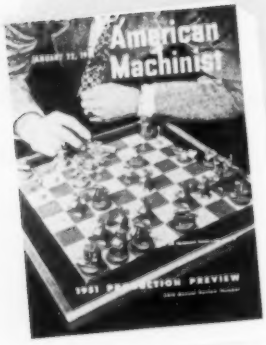


Check . . . Chess players will recognize the situation on our cover, although the untraditional shapes of the 'men" will make appraisal more difficult than usual. We've used high-production, modern models for the "whites"—actually the green and orange of "color dynamics"—and the more-familiar machine-tool gray for the older "blacks". The black king is moving out of check, but black's general situation is poor—as it is in real life when you depend on obsolete equipment. We're attempting to symbolize the importance of your checking every item of aging equipment, aiming at elimination of the "loss kings". This issue will serve as your handbook of replacement items.

This game, incidentally, was one of several we played to a photogenic setup, and it is most pictorial, although one other—showing a fool's mate—has black's situation much more hopeless. The models are precision built to a scale of ¼ in. to the foot. They are selected from the line of something like 6000 machine-tool models made by Comet Metal Products Company, Inc., Richmond Hill 18, N. Y., and used for planning and layout in many plants. The chessboard started out as a fine Abercrombie & Fitch walnut-and-maple inlaid job, but ended up in colors no chessboard ever had—all for purposes of this picture. Kodachrome by McGraw-Hill Studios.

Statistics . . . In addition to our usual statistical abstract, we provide the corrected figures on our Index of Metalworking and a chart—the latter with space for you to continue the lines during 1951. Thus you can stay current and still have former figures to check.

Preview . . . This, our 38th Annual Review Number, is also one of our largest. We've given it a new name, too, more in keeping with its purpose. While it does review the equipment, materials, and parts described in our pages during the past year, it actually provides in this review a preview of the equipment newly available to you for 1951 production, plus the statistics essential in planning. Hence we've called it the "1951 Production Preview".

As usual, we've classified the items of equipment for your greater convenience, and attempted to provide photographs as large as possible, with abbreviated descriptions giving salient specifications. We also provide postcards if you want us to get more data for you.

Sections are subdivided by color in accordance with the preference for that handling shown in our survey after last year's Review.

How . . . If we didn't have a 60-cent dollar, we'd be tempted to put thumb-index notches in the side of the editorial pages of this issue, and a string at the top corner, one to ease your use of the issue as a reference, the other to suggest that it be hung close by for frequent consultation during 1951. Something over 1500 items are described—all we could locate that were new in 1950. These are classified into three major groups by color: machine tools and attachments in green; tools and accessories, forging, forming and casting, heat-treating and welding in brown; and the other sections in blue. Within each major group, there are subgroups of specific types, and each such subgroup is further identified by corner labels. There's an index at the beginning of the preview section too—all to speed your use of the section.

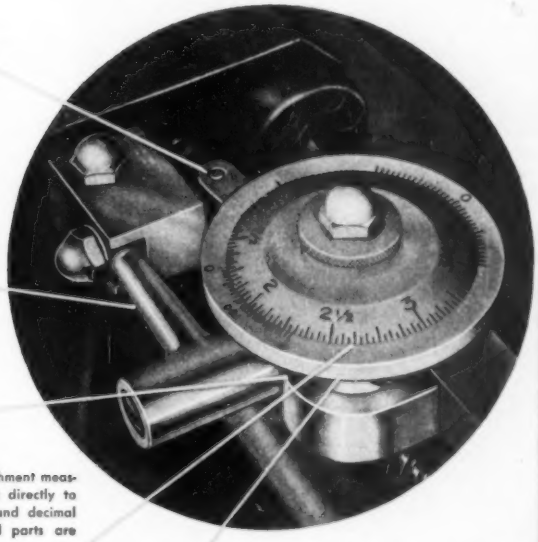
Coming . . . At this writing, we have our fingers crossed about our Special Report in Feb. 5 *AM*; it's still in Washington for approval. If we get it cleared, it will show, in pictures and captions, the unusual and generally applicable steps in making a turbojet. Most operations are on Inconel and stainless—which means headaches if you're not careful. There'll be a lead article on machining cast iron, another on use of multi-layer abrasive disks, another on layout of inspection stations, still another on what to watch for in subcontracting—quite a variety.

NEW EQUIPMENT . . . Norman Faber handles our new-shop-equipment departments—which put the load of this issue on his shoulders. Working before he started college and during school, he hired out as a barker for an amusement-park train ride, a corner-cutter in a paper-box factory, a night janitor for a school building, a laboratory assistant in a cable and wire plant, a machinist in the same plant, a record-changer adjuster in a radio plant, and—of all things—a Good Humor man. He did so well in this job, he branched out to rent a truck and sell ice cream independently one summer. He also worked a year for Federal Shipbuilding & Drydock Co. as a shipfitter.

Like many others who took the Grand Tour, courtesy of Uncle Sam, he saw parts of England, Belgium, Luxembourg, France, and Germany as a gunner in a 90-mm anti-aircraft battery. After the war he received his BSME from Newark College of Engineering, and in 1950 joined AM.

FORGINGS vs. CASTINGS?

Sorry, it wasn't even a contest!



The Weldon Lathe Attachment measures carriage movement directly to .001". Both fractional and decimal dials are available. All parts are chromium plated.

Anaconda Die Pressed Forgings illustrated are full-size and unretouched. On the spindle housing, right, machining costs were reduced 70%; on the dial, next above, 40%.

In the first place, they shouldn't be in the same ring together, because Anaconda Die Pressed Brass Forgings have almost twice the strength of ordinary brass sand castings.

The Weldon Tool Co. of Cleveland, makers of the Weldon Direct Reading Measuring Attachment for lathes, switched from sand castings to forgings and found the extra strength a big sales advantage.

They also found a lot of other things: Solid, dense-grained, readily machinable metal; die-like dimensional accuracy; a surface smoothness that cut finishing and plating costs to the bone. And . . . an overall saving of 30%!

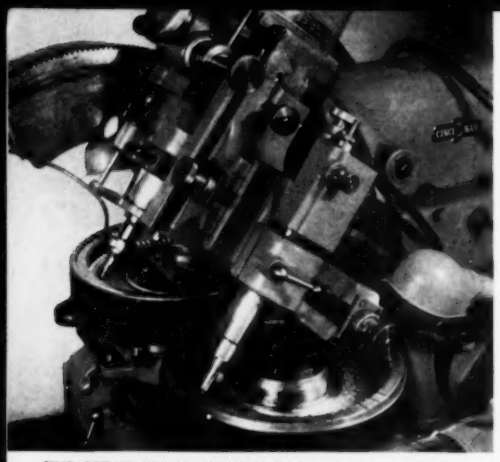
Publication B-9 will get you off to a good start. Write for it now. Address The American Brass Company, General Offices, Waterbury 20, Connecticut. In Canada: New Toronto, Ontario.

5H10z

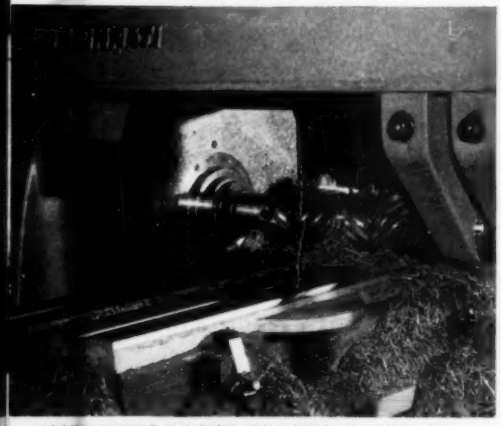
You can depend on twice-wrought

ANACONDA

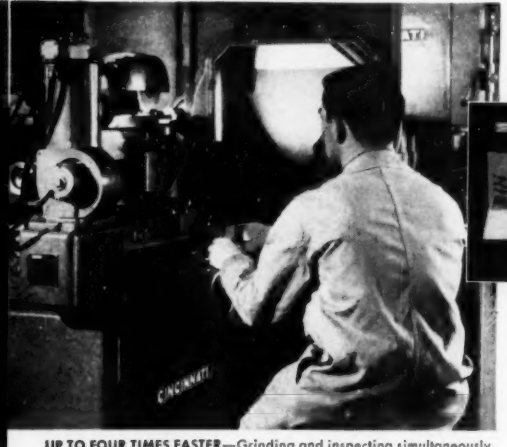
DIE PRESSED FORGINGS



FINE DETAIL MILLED AUTOMATICALLY—Side pattern on slowly rotating master (foreground) automatically reproduced in tire mold by CINCINNATI 8" x 18" Tool and Die Miller. Hand finishing time greatly reduced.



DOWN-MILLING AND RAPID STOCK REMOVAL—Milling the top surface and slot (from the solid) of two cutter grinder tables at one time, removing 3/16" stock. Production nearly double with new CINCINNATI No. 5 Dual Power Dial Type.



UP TO FOUR TIMES FASTER—Grinding and inspecting simultaneously. Accurate form tool and die parts ground 30 to 400% faster on new CINCINNATI Projecto-Form Grinding Machine. Typical example inset.

There's no

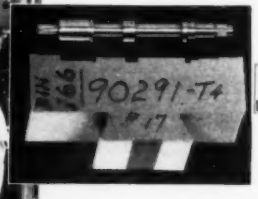
Your production costs are not frozen at their present levels . . . they can always be lowered to meet new business conditions. And there's no better way to do it than with new machine tools. Several actual case histories of worth-while cost reduction are illustrated here and outlined in the following paragraphs. All are products of The Cincinnati Milling Machine Co. and Cincinnati Grinders Incorporated, with engineering assistance in tooling by Cincinnati Application Engineers.

● **Grinding costs cut 75%.** A new CINCINNATI FILMATIC Micro-Centric Grinding Machine outproduces two old machines; cuts grinding costs 75%, and at the same time improves quality of sizing, roundness and squareness with one end.

● **Milling time reduced from 480 minutes to 25 minutes,** by tooling up a new CINCINNATI Tracer Controlled Hydromatic Milling Machine to mill various sizes of turbine blades.

● **Grinding cost reduced from 5c to 1c.** Five diameters of a food mixer shaft motor are ground at the same time on a CINCINNATI FILMATIC No. 2 Centerless Grinder, equipped with an automatic hydraulic infeed attachment and automatic magazine feed. The cost is only 1/5 the former method (centertype), saving about $9000 per machine in six months' time.

● **Ten hours saved.** Glass molds, machined complete on a CINCINNATI 8" x 18" Tool and Die Miller, now require only a fraction of the hand finishing formerly required. Additional savings are realized in the copy milling oper-



FILMATIC

CINCINNATI

Freeze on Costs

ation; now 18 hours compared to the former method which required 28 hours.

● **Cost of machining feet reduced 40%.** A progressive manufacturer of motors broaches the feet of motor frames on a CINCINNATI No. 5-54 Single Ram Vertical Hydro-Broach. One fixture accommodates four sizes of frames; cost reduced 40% over previous method.

● **Cutting capacity improved.** Small sizes of CINCINNATI knee-type milling machines—Nos. 2ML and 2MI—are capable of taking up to 25% heavier cuts than their predecessors; handling and set-up time is 15 to 25% faster. In the largest sizes—Nos. 5 and 6 Dual Power Dial Type—cutting capacity has been increased 50 to 75%; handling and set-up time cut 35 to 40%.

Case histories like those cited here are commonplace for machine tools bearing the Cincinnati trade-mark. They offer the most effective way to lower the floor under manufacturing costs.

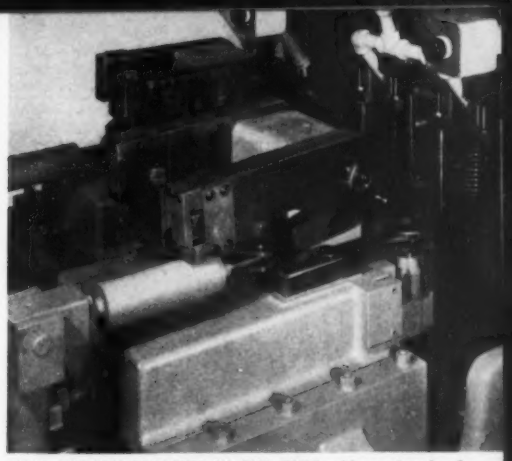
In all, there are 34 standard design types of Cincinnati Milling, Grinding and related machine tools, built in over 300 sizes and styles. CINCINNATI *FILMATIC Grinders handle work ranging from .004" diameter up to solid steel rolls 60" diameter, 15,000 times as large, and 665 million times as heavy. Cincinnati Milling Machines mill parts ranging in size from ¼" to 80' long. There's a Cincinnati for your type of work in the fields of: MILLING • BROACHING • CUTTER SHARPENING • DIE SINKING • GRINDING • CENTERLESS LAPPING. Write for a copy of our general catalog No. M-1646.*

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO

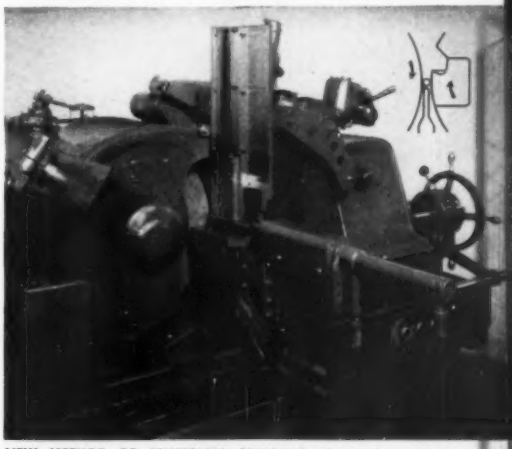
CINCINNATI

MILLING MACHINES • CUTTER SHARPENING MACHINES
BROACHING MACHINES • FLAME HARDENING MACHINES
OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

CENTERTYPE GRINDING MACHINES • CENTERLESS LAPPING MACHINES
CENTERLESS GRINDING MACHINES • MICRO-CENTRIC GRINDING MACHINES



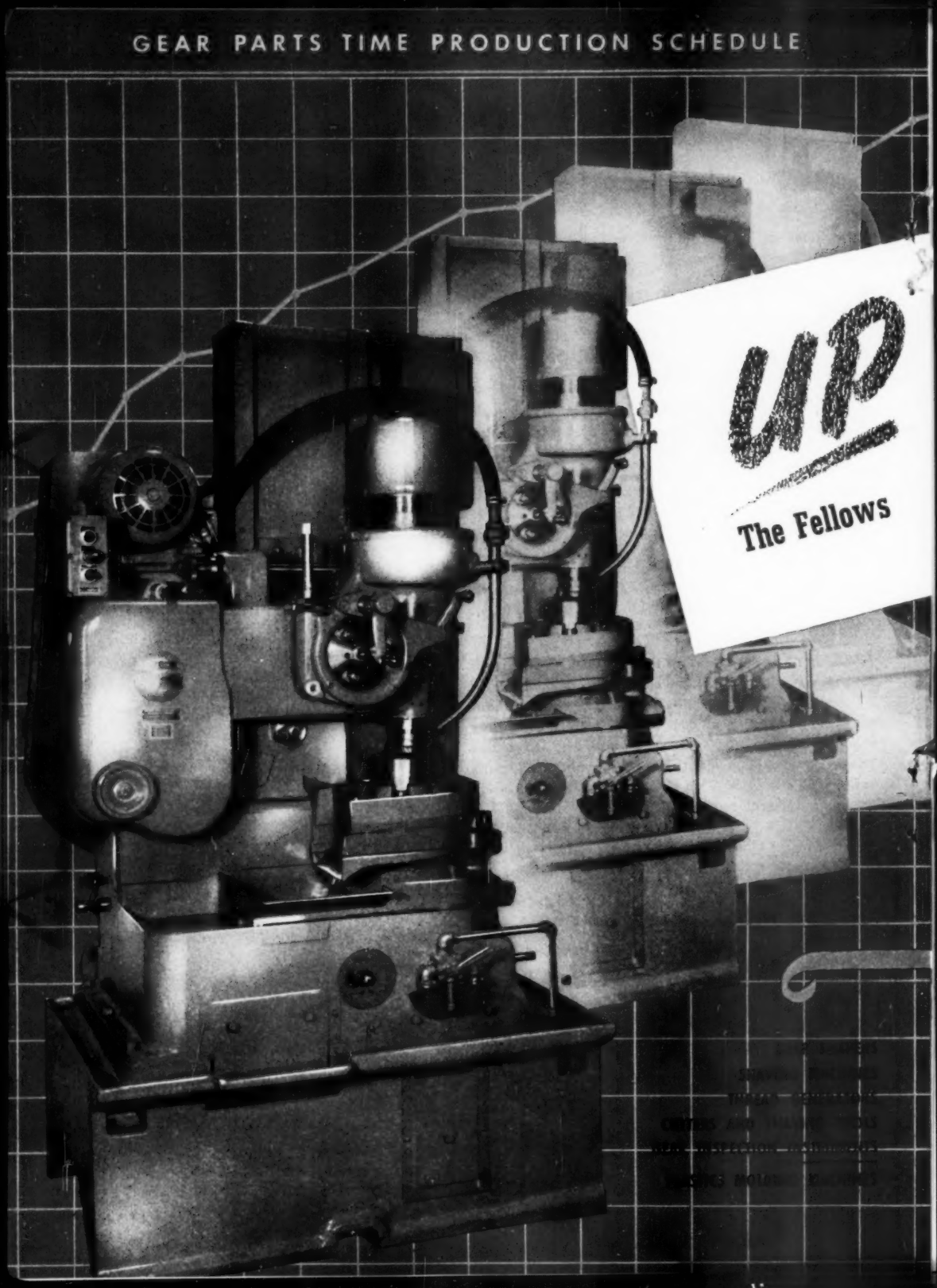
EIGHT SURFACES BROACHED IN ONE CYCLE—sides and ends of bolt bosses, and caps cut apart from the rods, at the rate of 480 sets per hour, on new CINCINNATI No. 10-66 Duplex Vertical Hydro-Broach Machine.



NEW METHOD OF CENTERLESS GRINDING—Cammed regulating wheel takes over the function of feeding to size for the operation of infeed grinding twist drills on a new CINCINNATI FILMATIC No. 2 Centerless Grinder.

MAINTENANCE CHARGES DECLINE SHARPLY—This new CINCINNATI FILMATIC 24" x 96" Roll Grinding Machine will require little maintenance in the years to come. FILMATIC bearings, automatic way lubrication and electronic table traverse control assure dependability.

GEAR PARTS TIME PRODUCTION SCHEDULE



GO TIME SAVING POSSIBILITIES

7A-Type Gear Shaper sets a Production Pace for 1951

For an internal gear part an air-operated diaphragm-type chuck like this makes loading and unloading a simple operation—for stop-watch timing.

- **AUTOMATIC QUICK-STOPPING OF CUTTER-SPINDLE RECIPROCATION**
- **AUTOMATIC POSITIONING OF CUTTER AT TOP OF STROKE (without coasting)**
- **AIR-OPERATED QUICK CLAMPING CHUCK**

Due to its amazing versatility, the 7A-Type Gear Shaper is able to compete with other production machines on a floor-to-floor time saving basis. High cutting speeds and precision control have always been there. To these advantages have been added speed-up of work handling, quick-acting work holding devices, etc.

The machines illustrated are set up to cut cast iron internal helical gears 27/32″ face width, 16 pitch, 20° pressure angle, 79 teeth (5.1313″ p.d.)—and to finish each gear in 2 cuts in 5 minutes floor-to-floor time.

If your requirements are not sufficiently large to require the enormous production possibilities of the 10-spindle Rotary Gear Shaper, let us work out time estimates based on 7A-Type Machines with the latest auxiliary modifications. Write, wire or phone the nearest Fellows engineering-sales office.

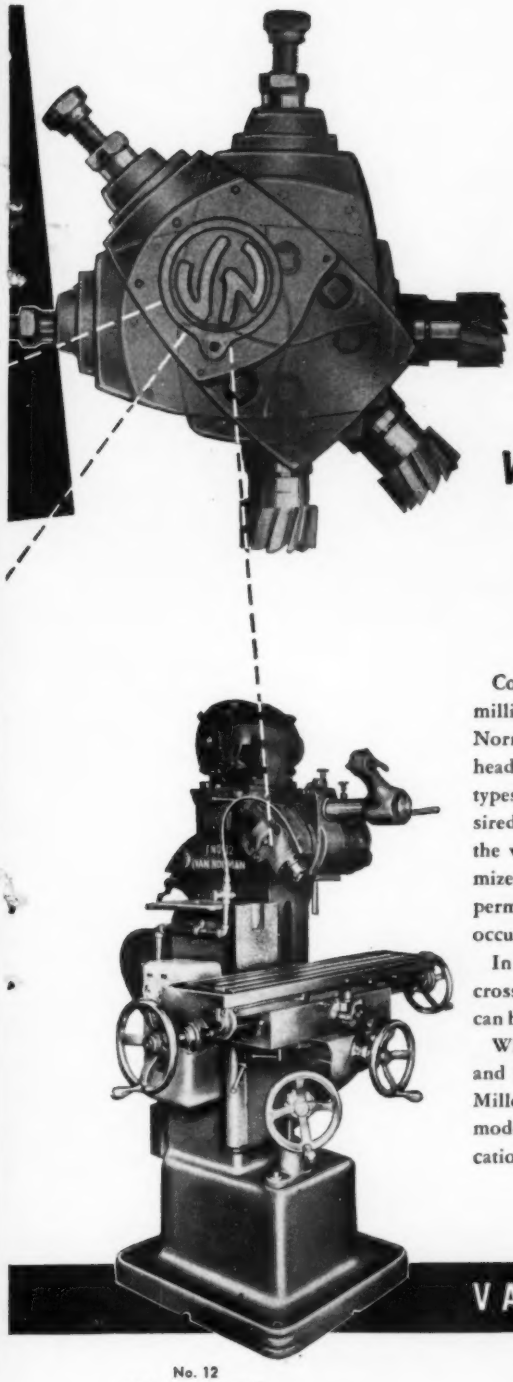
Fellows

THE FELLOWS GEAR SHAPER COMPANY • Head Office and Export Department • 78 River Street, Springfield, Vermont
Branch Offices: 616 Fisher Bldg., Detroit 2 • 640 West Town Office Bldg., Chicago 12 • 2206 Empire State Bldg., New York 1.

ADAPTABILITY
To Meet Milling Requirements

No. 22L
Table: 45" x 10"

No. 16
Table: 37" x 9¼"



IT'S THE ADJUSTABLE CUTTERHEAD

That Enables ONE Van Norman Ram Type Miller Do the Work of Several Single Purpose Machines

Conventional horizontal and vertical, as well as angular milling all on ONE miller . . . that's what you get with Van Norman Ram Type Milling Machines. The adjustable cutterhead, mounted on a movable ram, enables you to perform all types of milling by simply positioning the cutterhead in the desired position. Not only does this important feature give you the workability of several single machines, but it also minimizes work set-ups . . . cuts idle machine and operator time by permitting you to meet job to job milling requirements as they occur.

In addition, the movable ram in combination with the saddle cross feed increases the work range and capacity of work that can be handled.

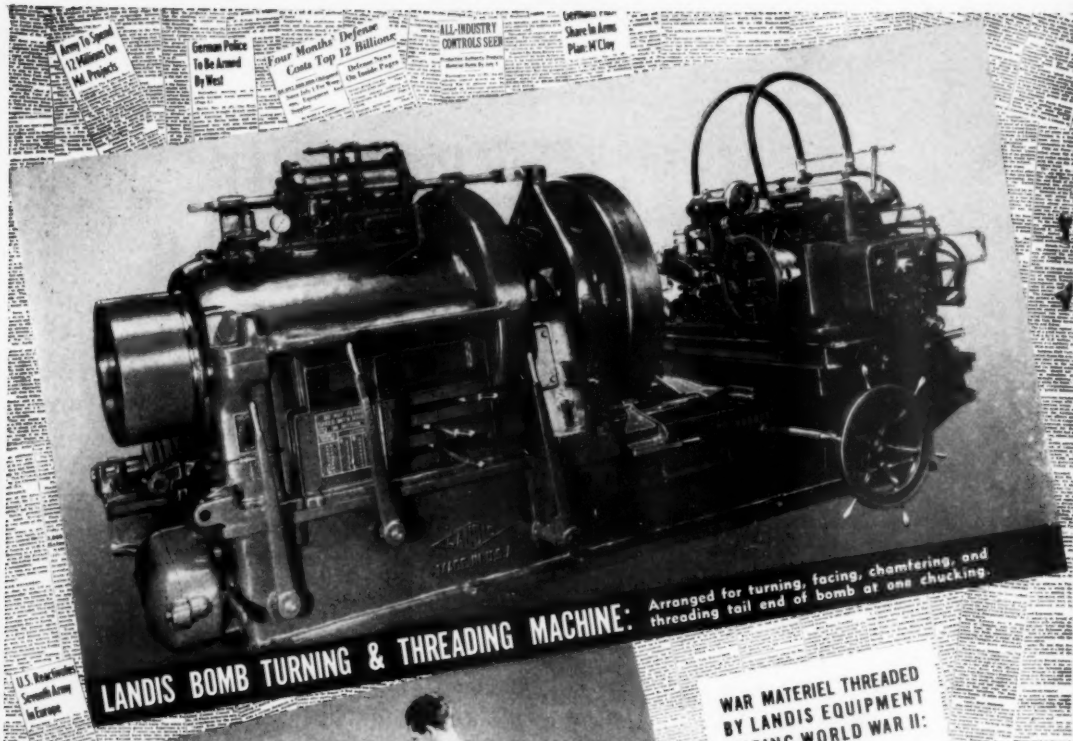
Whether it is for toolroom, production, machine shop, tool and die shop, or laboratory work, Van Norman Ram Type Millers increase production and cut costs. A wide range of models in various sizes are available to fit most every application. Write for information.

VAN NORMAN COMPANY

SPRINGFIELD 7, MASSACHUSETTS

"It Pays to Van Normanize"

No. 12
Table: 37½" x 9¾6"



LANDIS BOMB TURNING & THREADING MACHINE: Arranged for turning, facing, chamfering, and threading tail end of bomb at one chucking.

LANDMACO SHELL TAPPER: Type R Shell Tapper tapping the nose end of 75 mm. shells.

WAR MATERIEL THREADED BY LANDIS EQUIPMENT DURING WORLD WAR II:

- Garand Gun Barrels
- Shell Adapters
- Booster Cups
- Fuse Studs
- Cartridge Containers
- Shell Noses
- Fuse Bodies
- Demolition Bombs
- Anti-Aircraft Shells
- Trench Mortar Shells
- Rocket Shells
- High Explosive Shells
- Naval Shells (5" to 16")
- Bomb Base Plugs
- Hydraulic Tubes for Landing Gears
- Studs for Diesels used in Submarines
- Torpedoes
- Chemical Shells

LANDMACO MACHINE: Arranged for threading Garand gun barrels.

Air Defense Command Will Move To Colorado
U.S. Offers Financial Help To Speed Aluminum Output
AID SEEN VITAL TO EUROPEANS
United Europe Aid Program Urged
Extra 10 Billions May Be Asked For Defense
Tanks Blast Way Out Of Red Trap
Reds' Homemade Bazooka Blasts French Fort
Training Camp Limits Reduce Draft Calls
GE Produces All-Weather Jet Fighter
U.S. To Spend 45 Ton Tank Used To Beat
Action Is Taken To Meet Freight-Car Needs
U.N. Troops Gain 60 Along Front
Chinese Flee From Pe Reser

LANDIS THREADS AGAIN HELP AMERICA REARM

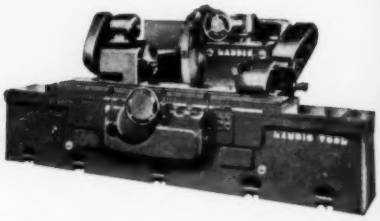
Threads produced by the various types of Landis Threading Equipment are again important in the operation of war matériel. Hundreds of Threading Machines, thousands of Die Heads and Taps, hundreds of thousands of sets of Landis Chasers were supplied to manufacturers of war matériel during World War II. It was once estimated that enough Landis Taps were in use to thread 20,000,000 shells a month.

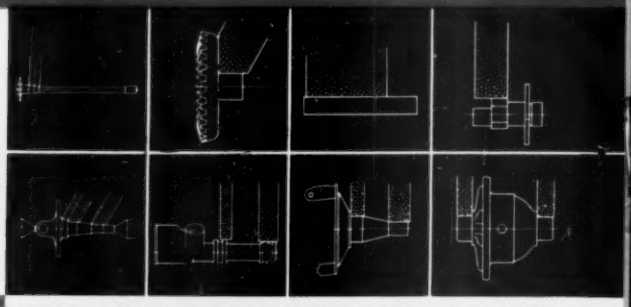
Illustrated on the left are three important wartime adaptations—but all Landis Threading Equipment can do an outstanding defense production job. Necessary adaptations, either in equipment or process, are developed by our Engineering Department from the wealth of experience gained during World War II. Write for further information and help with your Defense Threading Problems.

LANDIS *Machine* **COMPANY**
WAYNESBORO, PENNA.

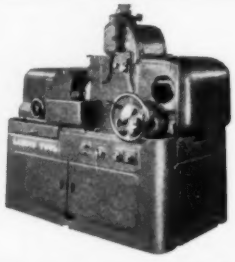
25 Ways to Solve Automotive Precision

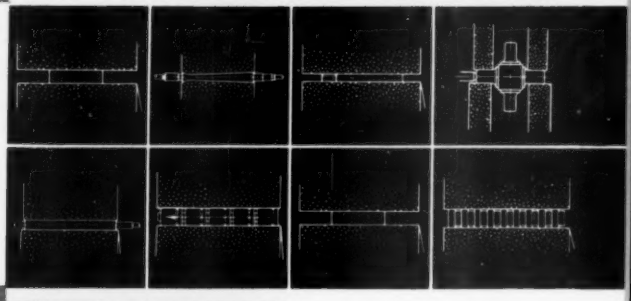
Plain Grinders



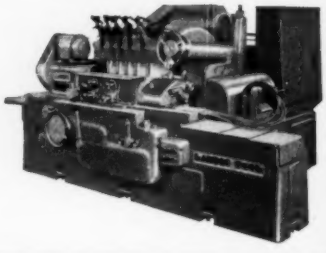


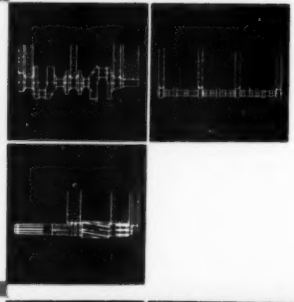
Centerless Grinders





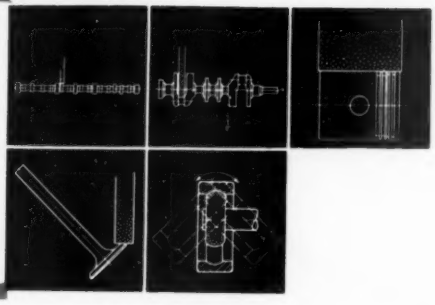
Multiple Wheel Grinders





Special Purpose Grinders

Crankshaft Pin
Camshaft Contour
Valve
Bearing Race
Piston



127

LANDIS TOOL *Precision Grinders*

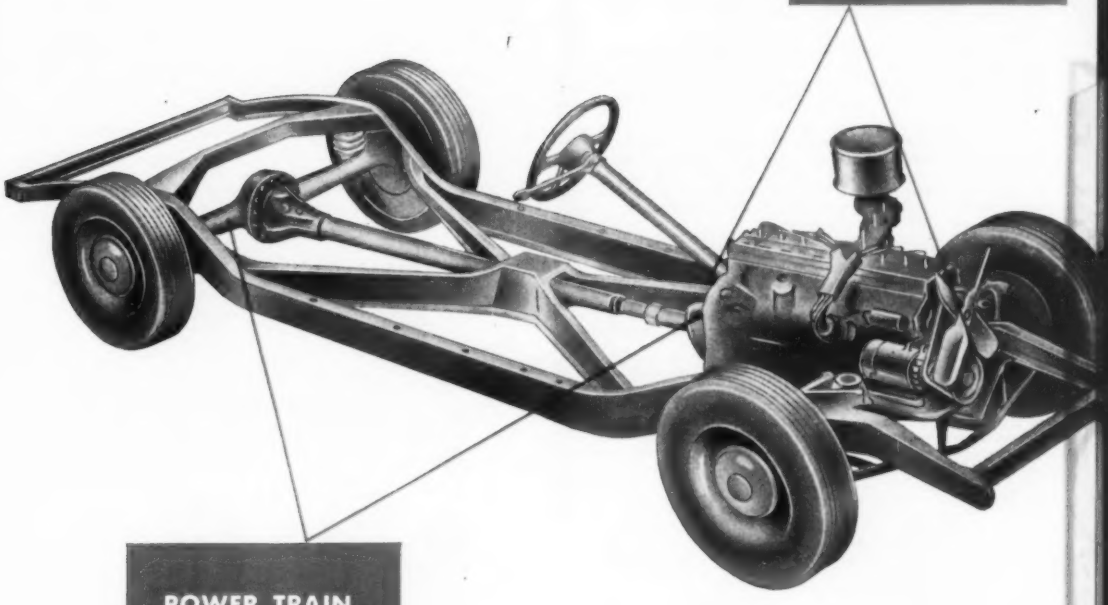
Write for 28-page condensed catalog with specifications.

Grinding Problems with

LANDIS TOOL
Precision Grinders

ENGINE

- Camshaft — main bearings
- Camshaft — contour
- Valves
- Valve Lifter Pistons
- Pistons
- Distributor Cam
- Generator Shaft
- Oil Pump Body
- Crankshaft — line bearings
- Crankshaft — pins
- Water Pump Shaft
- Piston Pins
- Inlet Valve Guide
- Pump Bushings

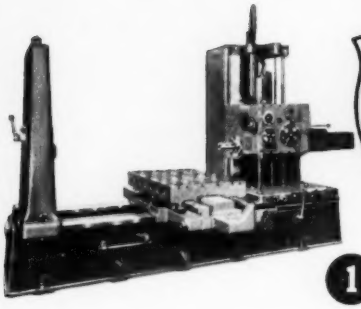


POWER TRAIN

- Bearing Race
- Rear Axle
- Hypoid Gear
- Differential Case
- Universal Joint Spider
- Transmission Shaft
- Gear Shift Lever
- Steering Knuckle
- Universal Joint Cross Pin
- Universal Joint Bearing Cup
- Front Wheel Spindle

LANDIS TOOL COMPANY • WAYNESBORO, PENNA., U. S. A.

These NEW and Giddings & Lewis Speed Work on Armament



1

Urgent delivery schedules on defense work can be met with these advanced G. & L. and Cincinnati Hypro machine tools.

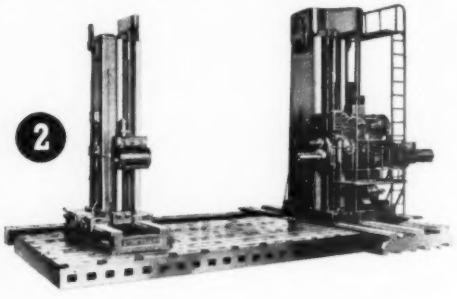
G. & L. *Horizontal Boring, Drilling and Milling Machines* offer open structure, plus flexible movement combinations of all major elements. As a result, the machines are capable of handling both ordinary workpieces and heavy, unwieldy, odd-shaped castings or fabrications. Often, different types of machining can be done in a single work setting. Operations may be performed

1 **300-T G. & L. HORIZONTAL BORING, DRILLING AND MILLING MACHINE**, recommended for medium-duty work, performs a broad variety of production operations at high speed. Advanced machine features assure reduced manufacturing costs on many types of work.

2 **G. & L. FLOOR TYPE MACHINES** are rigidly constructed for heavy-duty service. Large unwieldy work is easily mounted on floor plates. Machine headstock, spindle and column movement provides unusual versatility in machining hard-to-reach surfaces. Open construction of these machines gives greater latitude to design engineers.

3 **340-T TABLE-TYPE G. & L. MACHINES** have an operational range that makes it possible to perform milling, drilling, boring and similar functions in a single work setting. Use of standard machine accessories and attachments increases the flexibility and versatility of the machine. Equipped with the new G. & L. Automatic Positioning Device speeds precision operations.

4 **PLANER TYPE G. & L. HORIZONTAL BORING, DRILLING AND MILLING MACHINES** are used to exceptional advantage on large, heavy work that must be machined to high standards of accuracy. These machines are fast and flexible in performing standard and special work. These machines also have the open construction features that permit handling odd-shaped work with ease.



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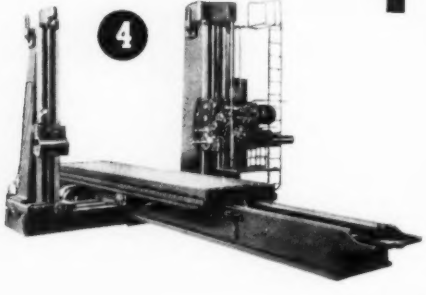

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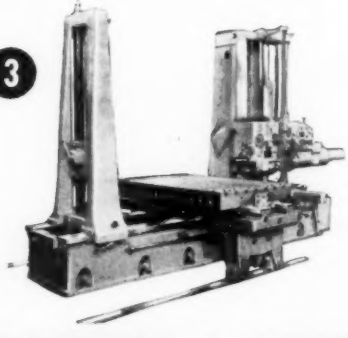
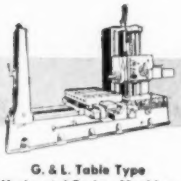


3

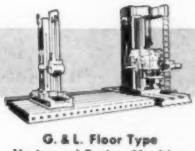
GIDDINGS & LEWIS

FOND DU LAC

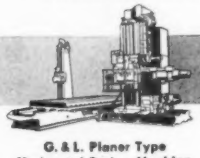
HYPRO



G. & L. Table Type Horizontal Boring Machine



G. & L. Floor Type Horizontal Boring Machine



G. & L. Planer Type Horizontal Boring Machine

IMPROVED Machines...

Cincinnati Hypro

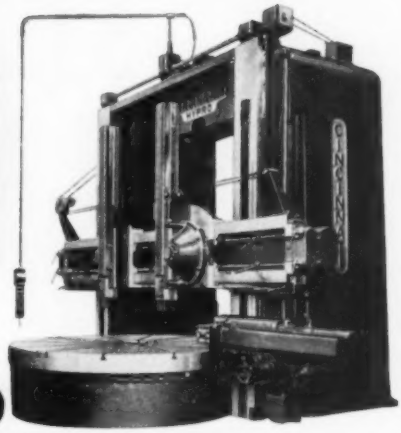
and Other "DO" Contracts

HYPRO

profitably on single pieces, short runs or mass production work.

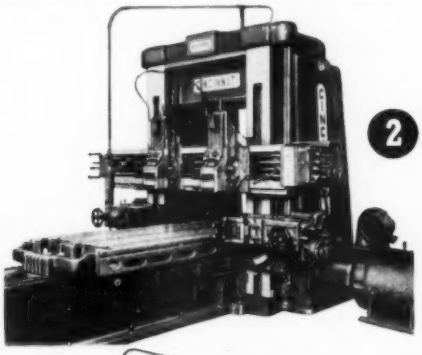
Cincinnati *Hypro Planers* and *Boring Mills* offer tremendous power and strength for taking heavy roughing cuts, and also permit finishing to unusual accuracy *on the same machine.* In addition, they make it possible to take full advantage of multiple tooling.

Study this broad line of modern machine tools. Learn how you can use them in obtaining profitable solutions to difficult defense production assignments.



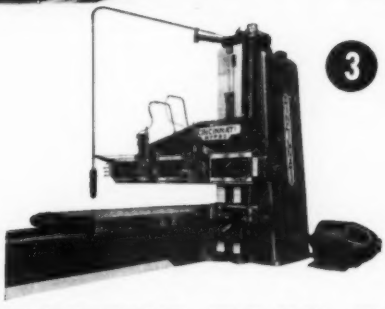
1

1 HYPRO VERTICAL BORING AND TURNING MILLS have many advanced design features and are built in sizes from 54 inches to 18 feet including 12-18 foot extension types. Outstanding features are ease of control, fast work setup, and wide range of speeds and feeds.



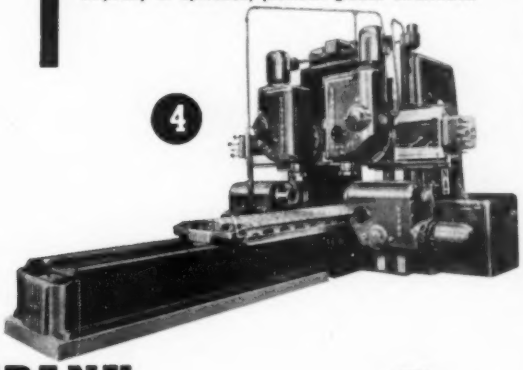
2

2 CINCINNATI HYPRO DOUBLE HOUSING PLANERS are available in a wide range of sizes that meet many planing needs. The *Chipmaster* is used for handling numerous small jobs; *Standard Hypro Machines* are available for general-purpose, medium-duty service; and Extra *Heavy Hypros* fulfill requirements for heavy-duty machining.



3

3 Available in sizes from 24" to 96", **CINCINNATI HYPRO OPENSIDE PLANERS** provide ample capacity and rigidity for completing many different types of work. These machines are unusually versatile in planing odd shaped work that would be difficult to set up between the housings of a conventional planer.



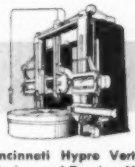
4

4 Featuring the Hypro Electronic Drive, **CINCINNATI PLANER TYPE MILLERS** are dependable for production run work. The machines are built in various sizes and will meet the manufacturing requirements of "stepped-up" production. Easy selection of feeds and speeds, combined with overall simplicity of operation, promotes greater efficiencies.

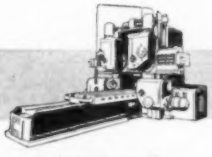
MACHINE TOOL COMPANY

WISCONSIN, U. S. A.

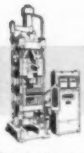
Cincinnati Hypro Double Housing Planer



Cincinnati Hypro Vertical Boring and Turning Mill



Cincinnati Hypro Planer Type Milling Machine

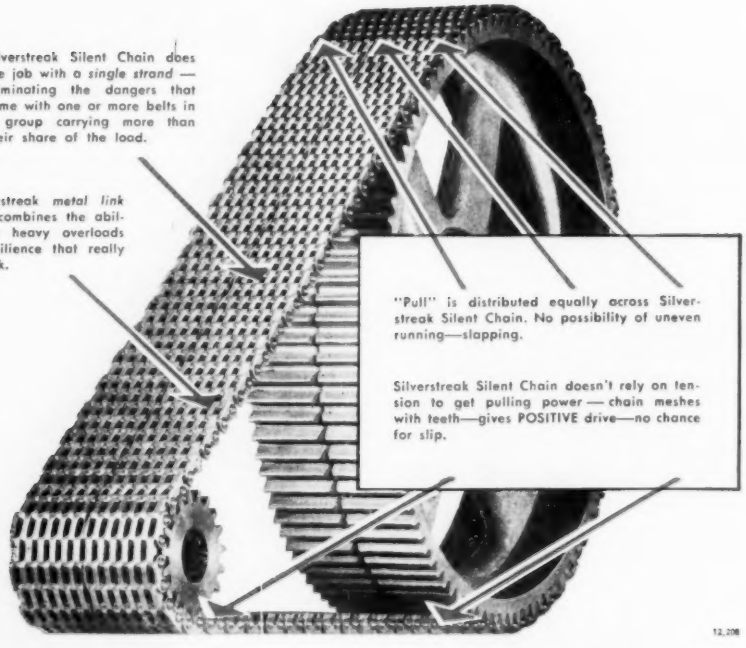


G. & L. Vertical Plastics Injection Press

DAVIS

Complete Tooling Service

SLIP-PROOF
SLAP-PROOF
SHOCK-PROOF


Silverstreak Silent Chain does the job with a *single strand* — eliminating the dangers that come with one or more belts in a group carrying more than their share of the load.
Husky Silverstreak *metal link* construction combines the ability to carry heavy overloads with the resilience that really absorbs shock.
"Pull" is distributed equally across Silverstreak Silent Chain. No possibility of uneven running—slapping.
Silverstreak Silent Chain doesn't rely on tension to get pulling power — chain meshes with teeth—gives POSITIVE drive—no chance for slip.
12,208

Get Full RPM Transmission With LINK-BELT Silverstreak Silent Chain Drives

Yes, get the amazing, trouble-free efficiency of 98.2%. A standard of operation that continues throughout the long, long life of the drive. More than this — every rating and design is backed by a record of *proven performance*. And every chain is engineered for the job. You conserve space, too — for Link-Belt Silverstreak Silent Chain Drives operate efficiently on short centers. Ratios as high as 10 to 1 are commonly used.

Little wonder, then, that so many concerns to whom top operation efficiency and rugged dependability are a must, standardize with Link-Belt Silverstreak Silent Chain Drives.

LINK-BELT COMPANY, Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Johannesburg. Offices in principal cities.

LINK-BELT

SILVERSTREAK SILENT CHAIN DRIVES

GARDNER

precision disc Grinders

Finish Grinds 400 Piston Rings Per Minute

TWO faces ground in ONE operation . . . automatically

No. 630—30" DOUBLE DISC GRINDER

Grinding piston rings from 2½" to 5½" diameter. Power-operated dresser. Tolerances: .0001" for parallelism and .0003" for uniformity.

For lower production costs investigate the Gardner TWO in ONE method.

NEW MAGNETIC FEEDER with inclined, vibrating work trough carries rings thru machine between adjustable guide bars.

100M

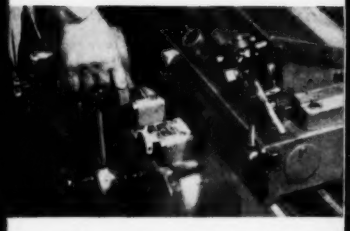
GARDNER MACHINE COMPANY

410 East Gardner Street • Beloit, Wisconsin, U.S.A.

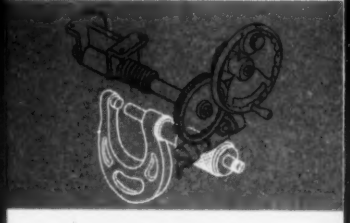
To Buy the Best . . .

OPERATORS SAY—

"Easier to handle"



"Like a push-button radio"



"Really holds size"

"Eliminates worry of work spoilage"

MANAGEMENT SAYS—

"Outperforms earlier makes"

"Inspection costs reduced by uniform sizing performance"

Four new free catalogs describe the features of the CTU machines. No. 1787 covers the 10" semiautomatic, No. 1488 the 6" semiautomatic, No. 166 the 10" plain and No. 157 the 6" plain machine.

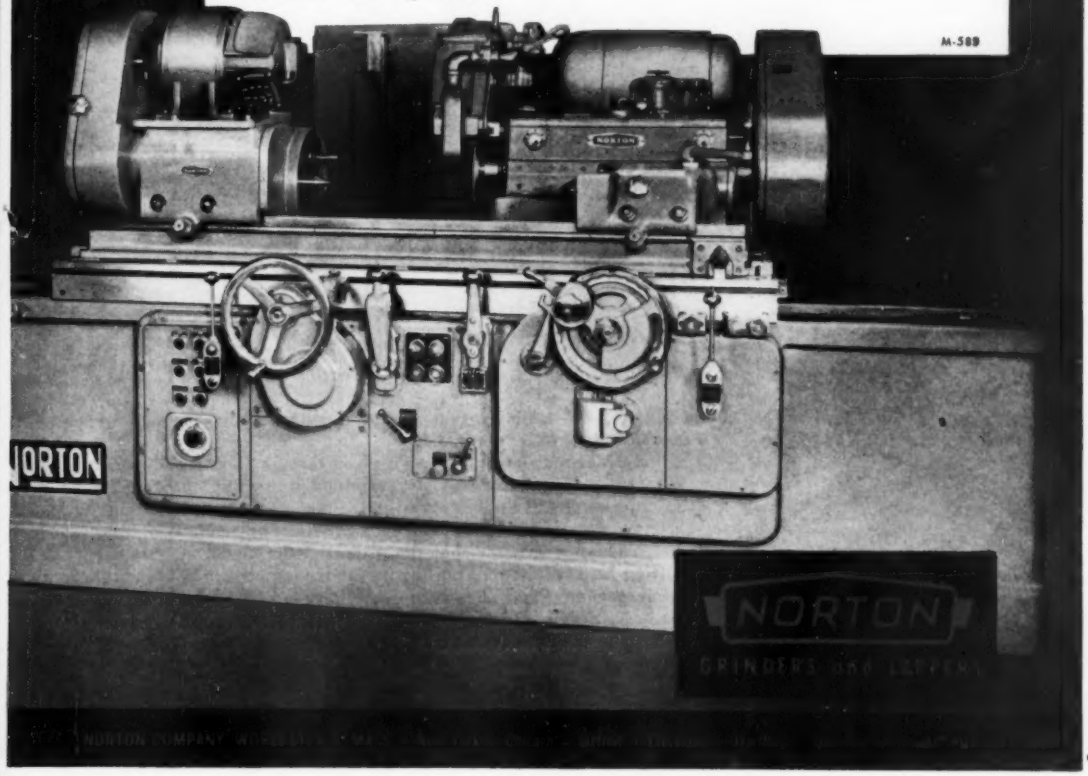
Making better products to make other products better

. . in Cylindrical Grinders

Ask the Men Who Know the Norton TYPE CTU Machines

MANAGEMENT men and operators combine to put their stamp of approval upon the Norton Type CTU machines for these important reasons. Outstanding are the high productive capacity, superior quality of work, minimum floor space and reduced maintenance obtained with the 6″ and 10″ Norton Type CTU cylindrical grinders. Older or less productive grinders cannot successfully compete in these times of rising material and manufacturing costs. Use of more productive equipment is the only way costs can be substantially reduced. That is why it does not pay to keep obsolete models in production and ignore the cost savings and other important advantages that may be obtained from the strictly modern and more efficient Norton grinders.

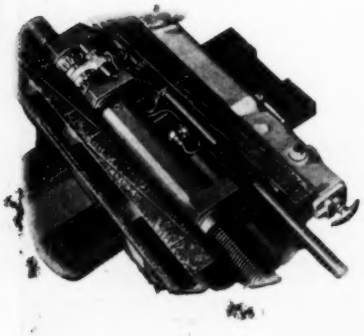
M-589



GREATER MACHINE LIFE

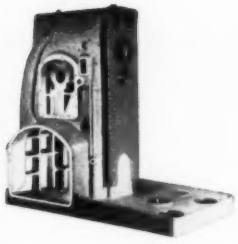
A new line of Knee-Type Milling Machines

KEARNEY & TRECKER MILWAUKEE **CK's**

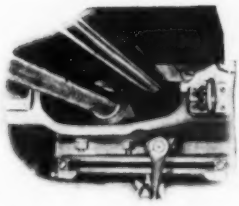


Part by part — unit by unit — Kearney & Trecker's new CK milling machines are built to give you the maximum in *Greater Machine Life.* Generously proportioned gears and shafts, plus automatic, positive lubrication easily meet overload conditions. Every component is engineered to provide the kind of rigidity and resistance to wear that the greater horsepower and heavier cutting loads of modern milling methods require. For fullest protection, column and knee are forced flood lubricated. A positive, metered, pressure system takes care of table, saddle and knee ways and table feed assembly. Add Greater Machine Life to all the other great new CK features and you'll see why these new CK's are the most productive, most profitable milling machines you can buy today — anywhere!

Replacement of obsolete machine tools is an



GREATER RIGIDITY — Yes, these new CK columns are the most rigid milling machine columns we've ever designed! They give you 1000 pounds more metal scientifically distributed in heavier ribbing, box section, sponson construction . . . to effectively absorb vibration from heaviest cutting loads.

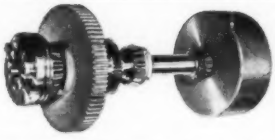


SMOOTHER FEED PERFORMANCE — with a new design 2" diam. heavy-duty, table feed screw that affords greater bearing contact and runs through an extra-long table feed nut. These new CK machines are equipped with a backlash eliminator for more effective climb milling, more accuracy and longer screw life.

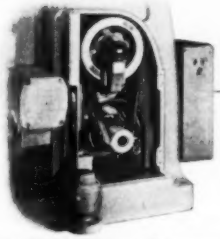
GREATER ADAPTABILITY — No. 60 Heavy Duty drive flange on Nos. 4, 5 and 6 machines enables use of heavy duty arbors with flange drive for large single or multiple cutter setups; or bolting large face-milling cutters directly to spindle nose. Average setups use standard arbors with No. 50 spindle drive.

NON-GLARE RAPID-SET DIALS—You'll avoid costly errors in reading and setting these new micrometer dials. They're vapor blasted to give you a satin surface with high contrast markings. They're easy and quick to set and provide positive lock at every setting.

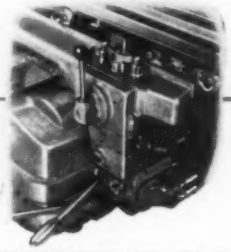
FEEDS AND SPEEDS TO TAKE FULL ADVANTAGE OF MODERN CUTTING TOOLS — and you really can do it with the broad feed and speed ranges on Kearney & Trecker's new CK milling machines. You get 24 spindle speeds (15 to 1500 rpm on Nos. 2 and 3, 13 to 1300 rpm on Nos. 4, 5 and 6) with Kearney & Trecker's automatic protecto-mesh shift to eliminate gear clashing. And there's the extra-wide feed range — 32 changes from ¾" to 90" per minute—with separate 3 or 5 hp feed and rapid traverse drive.



GREATER CUTTING EFFICIENCY — Added momentum of spindle-mounted flywheel assures longer cutter life and greater efficiency, through smoother, more positive drive — a key to most efficient use of modern cutting tools. Spindle rigidly supported by Kearney-& Trecker's original 3-bearing design.



GREATER HORSEPOWER — where you need it. That's what you get with new CK independent motor drives for spindle and for feed and rapid traverse. Depending on machine size (Nos. 2, 3, 4, 5 or 6), machines range from 10 to 25 hp for spindle drive and 3 to 5 hp for feed and rapid traverse.



GREATER PRODUCTION AND GREATER OPERATING CONVENIENCE—Production men will like Mono-Lever Control because it reduces idle cutter time, shortens floor-to-floor cycle time on both long and short run lots. Operators will like it because it makes faster, simpler, less fatiguing work for them.

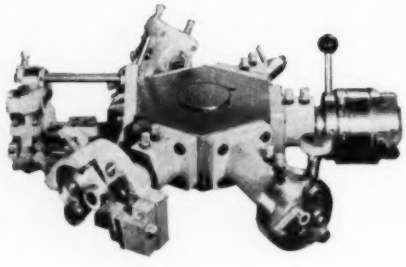
Kearney & Trecker's new CK line of knee-type machines is designed to meet every demand of present-day milling . . . making them more accurate, and MORE PRODUCTIVE for you. Contact your Kearney & Trecker representative or write direct to obtain their complete specifications. Find out how CK machines easily replace obsolete machines at substantial savings to you. Kearney & Trecker Corp., 6784 N. National Ave., Milwaukee 14, Wis.

investment that makes Dollars and Sense.

PICTURE OF A MAN PRODUCING

same job, same operation

BUT BETTER TOOLS!



● Electrol Incorporated, of Kingston, New York, transferred this precision Stop-Plunger job to a Warner & Swasey No. 3 Universal Turret Lathe because it had the speed and accuracy required, as well as the proper tooling for the job. The result was a 25% increase in production of this high pressure hydraulic control part.

This shop has found it can do more jobs faster on Warney & Swasey Turret Lathes with the Standard Tooling Setups that fit their requirements. Multiple and combined cuts, with shorter setup time, mean profitable production increases.

Call your nearest Warner & Swasey Representative for service and assistance

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EAST HARTFORD
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EAST ORANGE
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GRAND RAPIDS
190 Monroe Ave. N. W., Grand Rapids 2, Mich.
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INDIANAPOLIS
6729 Evanston Avenue, Indianapolis 20, Ind.
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NEW ENGLAND
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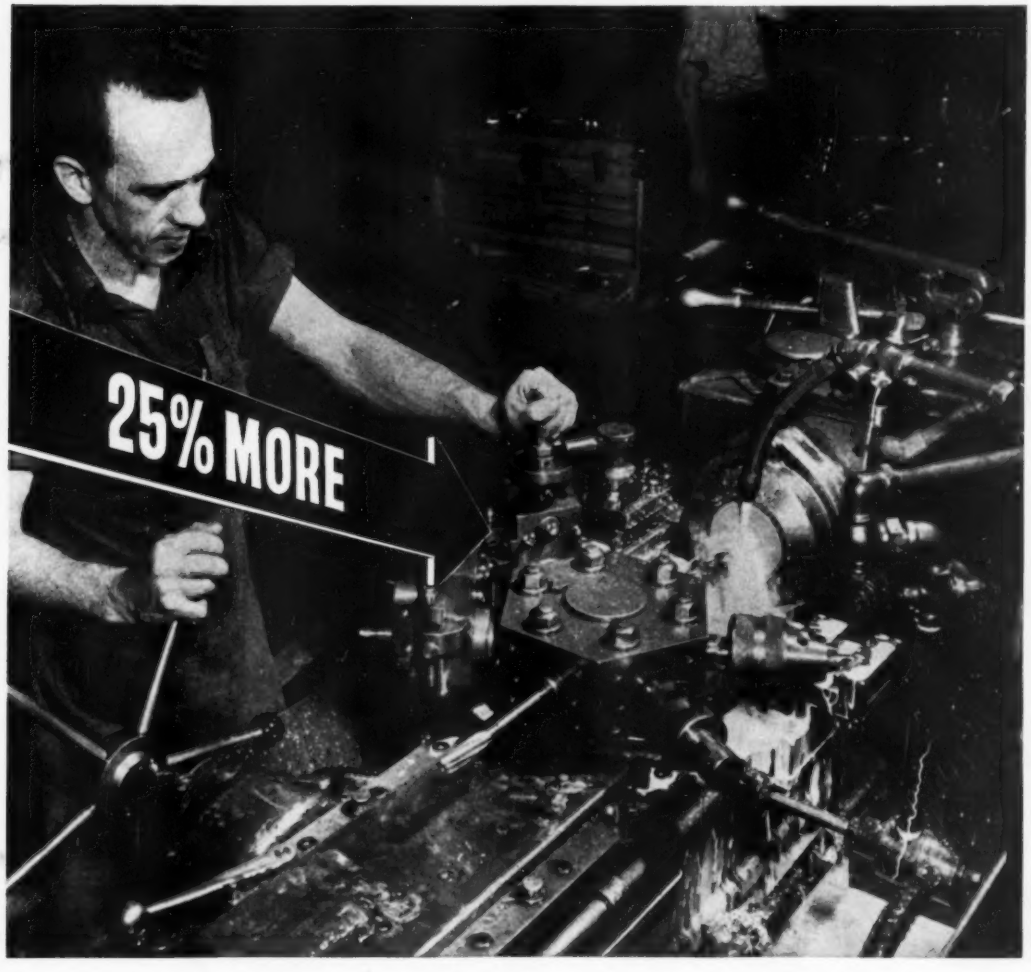
TURRET LATHES, MULTIPLE & SINGLE SPINDLE AUTOMATICS,



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Permanent Universal Tooling setups and the right tools which can help you increase your output are all in the new 194 page Warner & Swasey Tool Catalog.

WARNER & SWASEY SELLS ONE THING...

INCREASED PRODUCTION

WARNER & SWASEY
Machine Tools
Cleveland

PRECISION TAPPING AND THREADING MACHINES

MORSE
Want "Sure-Shot" Production?..

Then Remember—

MORSE QUALITY

. . . in every type of cutting tool . . . is sold only by your

MORSE-FRANCHISED DISTRIBUTOR

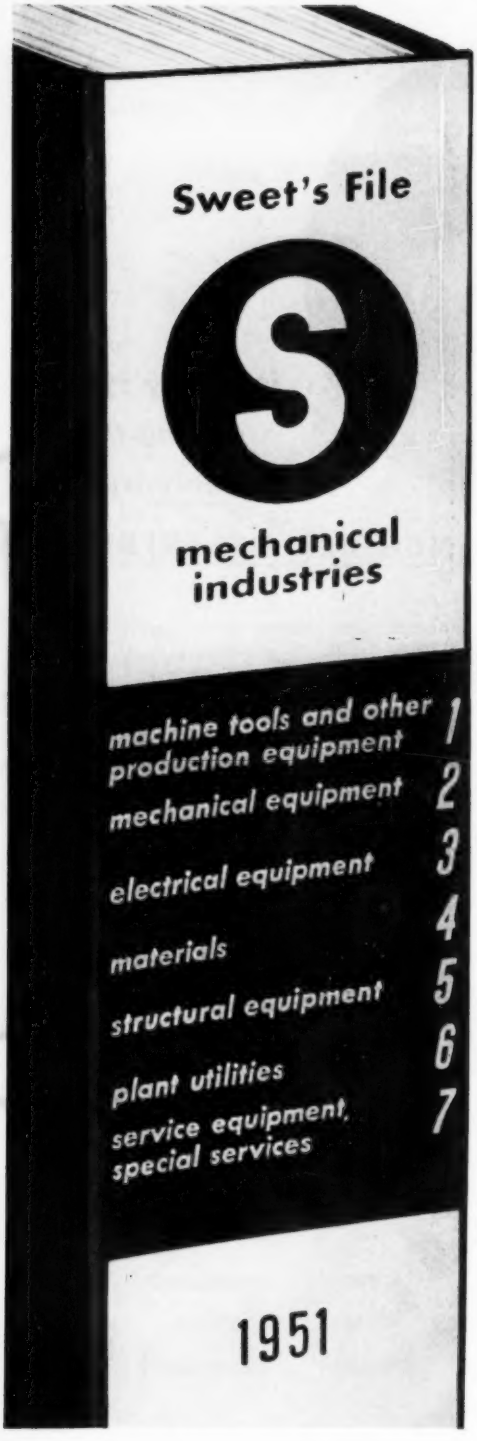
MORSE MEANS *MORE* PRODUCTION . . . smoother, more accurate production . . . with every type of cutting tool from drills, reamers, taps and dies, to end mills, milling cutters, slitting saws and "specials."

And Morse Quality is steadily being advanced by Morse Engineering and Research . . . as you would expect of the company that originated and developed the twist drill.

That's why, on every cutting tool order, it's good business to specify "MORSE" and shoot it in to your Morse-Franchised Distributor. And if you want still *higher* production, specify "MORSE Electrolized."

Morse Twist Drill and Machine Co., New Bedford, Mass. (Div. of Van Norman Co.)
Branch Warehouses in New York, Detroit, Chicago, San Francisco

MORSE



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Make Containers Count

(and everything else, too)

with

VEEDER-ROOT COUNTERS

Containers . . . coin machines . . . compressors . . . corn-husking machines . . . (or what have *you*?) . . . all these and scores more count to the greater advantage of their users or producers, *or both* . . . with Veeder-Root Counters. These infinitely useful devices, electrical or mechanical . . . may be either applied to a process or *built into a product* as original equipment. WRITE: Veeder-Root Inc., Hartford 2, Conn. (New Phone: 7-7201). *In Canada:* Veeder-Root of Canada, Ltd., 955 St. James St., Montreal 3. *In Great Britain:* Veeder-Root Ltd., Kilspindie Rd., Dundee, Scotland.

"VEEDER-ROOT COUNTS EVERYTHING ON EARTH"

72 hrs. of heat treatment

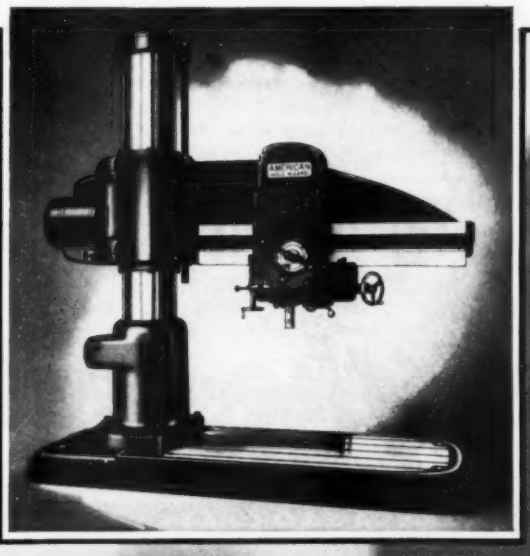
. . . required to produce the ultimate in radial drill spindles

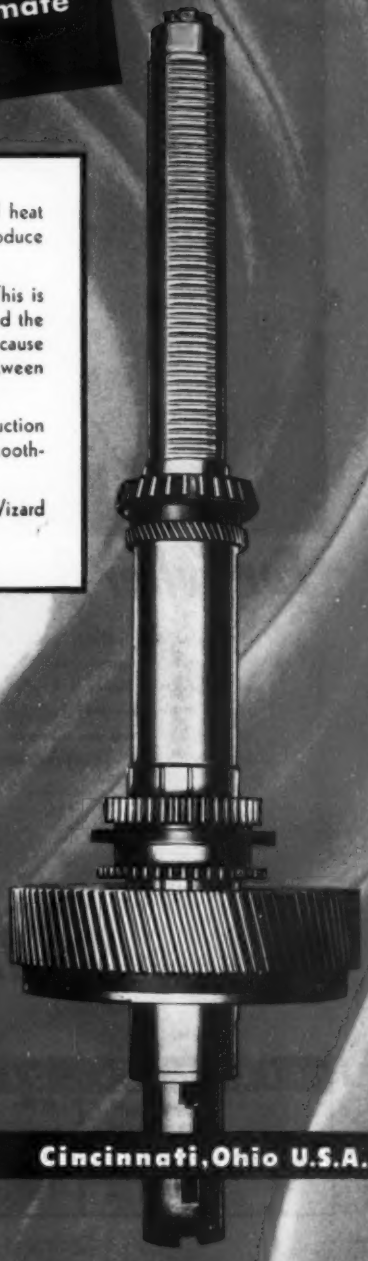
"AMERICAN" Radial Drill Spindles are made of nitralloy. 20 hours of heat treatment from rough to finish, then 72 hours of nitriding are required to produce the wear-resistant spindles used in these radials.

Both the spindles and sleeves are nitrided to 110 degrees scleroscope. This is harder than some grades of cemented carbide. The sleeve is finish honed and the spindle ground and then diamond lapped to a sliding fit in the sleeve. Because of the lack of affinity between these two hard surfaces the clearance between them may be reduced to the very minimum, which in this case is .00025".

This results in the greatest possible stability, resulting in an ideal construction especially for accurate boring operations, which demand a high degree of smoothness and rigidity of the spindle.

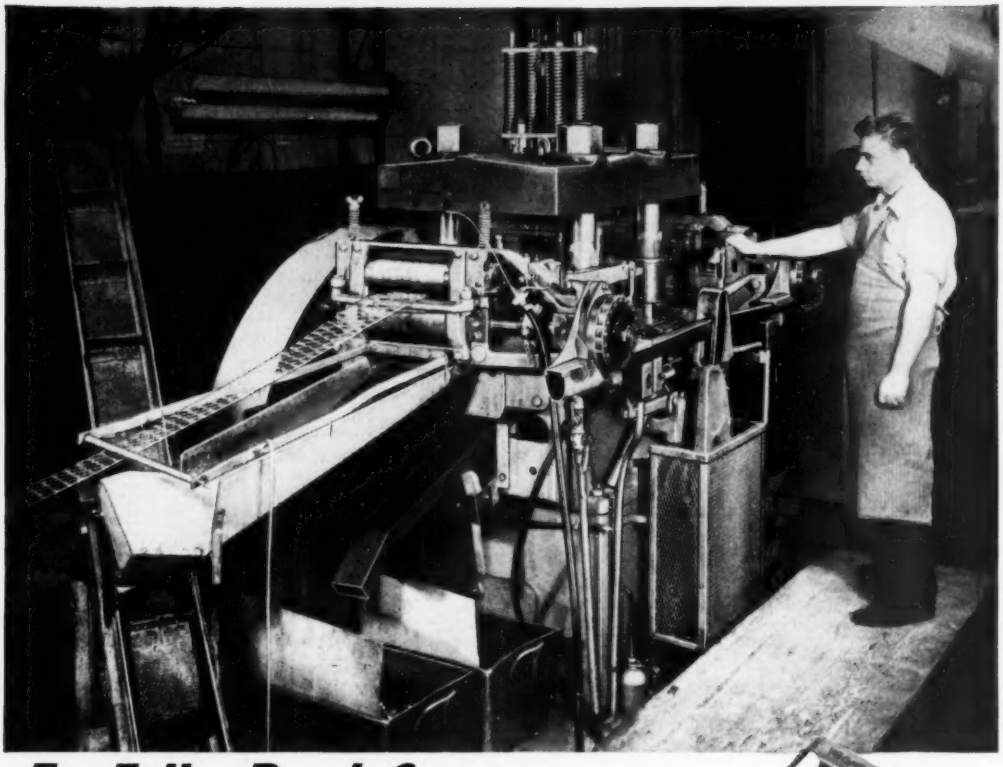
This is but one of the super features that make the "AMERICAN" Hole Wizard an outstanding investment.





THE AMERICAN TOOL WORKS CO. **Cincinnati, Ohio U.S.A.**

Lathes and Radial Drills



For Fuller Brush Company

Above illustration shows the 150-ton Henry & Wright Dieing Machine used by Fuller Brush Company to produce stampings, ring knobs, mop hinge clasps and other metal parts. Complete-per-stroke Henry & Wright progressive dieing machines set production records wherever they are installed. Yet get more stampings per hour, per square foot of space. Scrap losses are minimized. Henry & Wright machines not only produce at high speeds — their unique design increases die life by as much as 1200%.

Only the best is

PRODUCTS OF OUR ASSOCIATES INCLUDE:

PREMIUM QUALITY STAMPING PRESSES

THE V & O PRESS CO.
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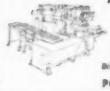
HUDSON, NEW YORK

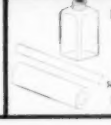
GLASS MAKING MACHINES

GLASS DIVISION
Hartford-Empire Company
HARTFORD 2, CONNECTICUT



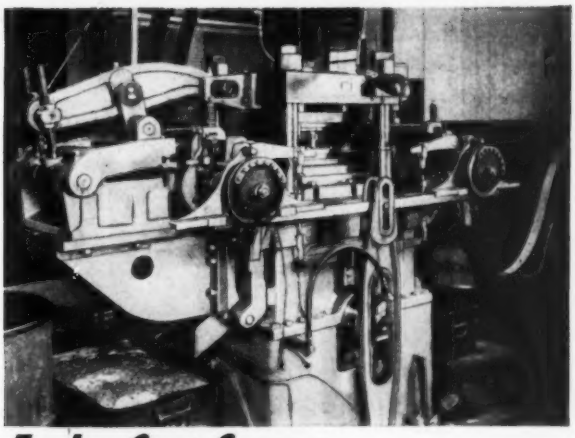
AUTOMATIC PACKAGING EQUIPMENT

STANDARD-KNAPP
Division of Hartford-Empire Company
PORTLAND, CONNECTICUT



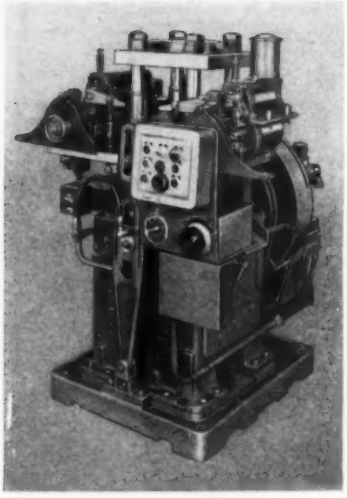
PLASTIC BOTTLES, RODS, TUBES, SPECIAL SHAPES

PLAX CORPORATION
Subsidiary of Hartford-Empire Company
HARTFORD 1, CONNECTICUT



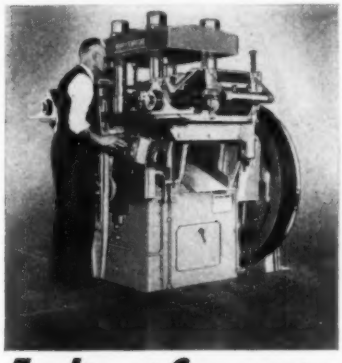
For Lux Clock Company

where Henry & Wright Dieing Machines get "practically every part we can put on a press." Lux keeps its seven H & W machines running "13 hours a day, seven days a week". Scrap loss is estimated at less than half of what it would be on other presses. Die life is doubled.



For Imperial Knife

Company, where four 25-ton Henry & Wright Dieing Machines do a fast, economical and efficient job of fabricating parts for pocket knives.



For Lionel Corporation

Installation, consisting of four 25-ton, seven 50-ton and one 75-ton Henry & Wright Dieing Machines, turns out transformer laminations and other parts.

good enough

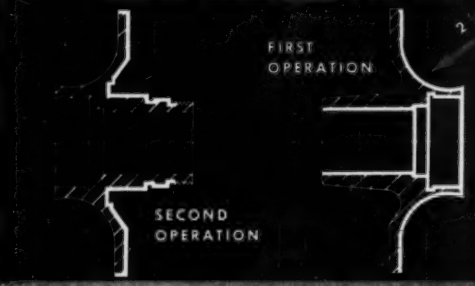
FACT PACKED CATALOG
Complete descriptions of all Henry & Wright Dieing Machines. Write: Henry & Wright, 480 Windsor St., Hartford 5, Conn.

Henry and Wright

H&W

HENRY & WRIGHT
Division of Hartford-Empire Company

PROBLEM:

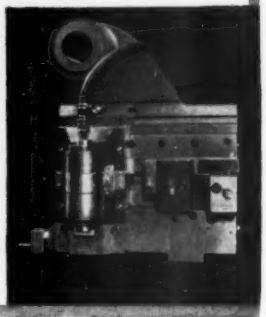


MACHINE RADIUS AS SINGLE POINT CUT (NOT BROAD FACE) AND BLEND SMOOTHLY WITH FACING CUT. HEAVY LINES INDICATE ALL SURFACES TO BE MACHINED IN TWO OPERATIONS USING TUNGSTEN CARBIDE TOOLING. PART: 1040 STEEL PUMP WHEEL FORGING.

SOLUTION:

SET UP ON TWO P&J 5DELX AUTOMATICS WITH P&J TOOLING

Some 45 roughing and finishing operations are completed, with reductions in time and labor costs. Generous savings are effected by generating tool (right) which, in combination with slide tool, generates 2 5/32" radius, blends it perfectly with the facing cut.



RESULT:

A complete piece every 12.5 minutes — that's the time it takes to complete *both* operations, with greater accuracy, better work, fewer rejects. Secret of this profitable performance is the skillful engineering of secondary operations into a main setup . . . the elimination of all unnecessary work handling . . . the gaining of additional savings in divided labor costs by one man's operation of 2 or more P&J Automatics. Send sample parts or prints for a low-cost P&J tooling recommendation and time estimate.

P&J 50 YEARS' EXPERIENCE IN TOOLING FOR

Precision + Productivity + Economy

POTTER & JOHNSTON CO.

PAWTUCKET, R. I.

subsidiary of **PRATT & WHITNEY**

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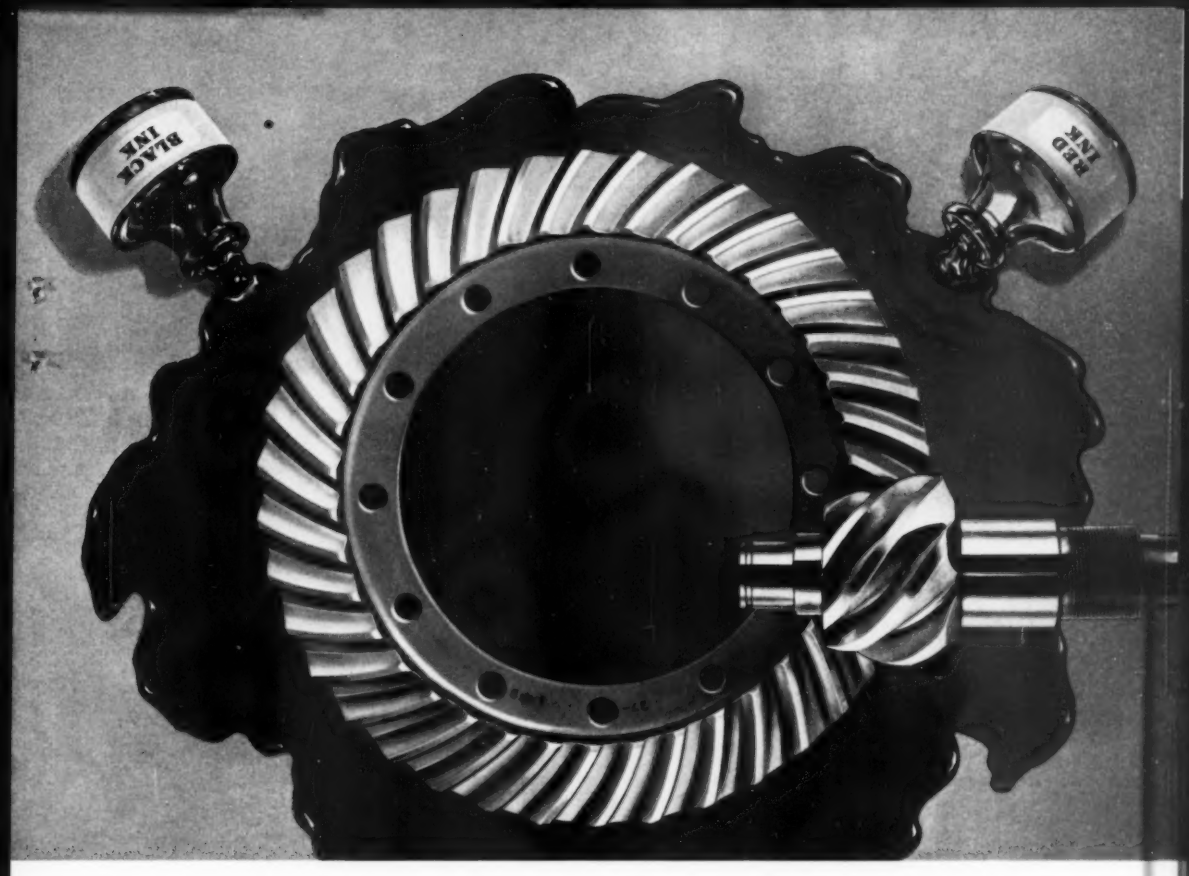
P&J



Where Does the Red Begin?

WHERE GEARS are concerned, that's a question you may want to ask yourself. Too often the red ink begins too soon. It may begin with gears not dependably up to your specifications. You may find it in production slow-downs due to gear installation difficulties. You may find that poor performance is building up your service costs.

You may discover that gear-troubles are causing your customers to think of competitors' products.

If the red ink begins at *any* of these points you'll be well rewarded by discussing gear problems with "Double Diamond" engineers. "*Double Diamonds*" *are produced to work in the black.* They provide low installed cost. They serve economically and dependably on the job for which you buy them. They do credit to your product and your reputation.

We have thirty-six years of such gear-building behind us. We believe we know gears, and we believe we know the true facts about gear costs. We'd like to discuss these matters with you at your convenience.

DOUBLE DIAMOND
TRADE MARK
GEARS

Automotive Gear Works, Inc.
RICHMOND, INDIANA

FOR AUTOMOTIVE FARM EQUIPMENT AND GENERAL INDUSTRIAL APPLICATIONS

Reg. U. S. Pat. Off.

"Good luck on our worst job"

HOW DAKE HYDRAULIC WORKHEADS SOLVED A DIFFICULT PRODUCTION PROBLEM

The manufacturer of an automobile attachment (name on request) has to blank, punch, and form 61 ST-6 sheet aluminum —mostly .081 to .125 of an inch thick. Crimping and making sharp U-bends in such material is a difficult job, at best.

To facilitate his production, he mounted two 50-ton air-hydraulic Dake Workheads on a frame and table of his own contrivance, and made up a die similar to those used in aircraft manufacture.

With this very moderate investment, he now does a really beautiful forming job on metal that is not easy to work. He writes, "We have just completed installation . . . and are having very good luck with our worst forming job."

This is another example of how ingenuity in the application of Dake Presses can improve production and reduce costs. An illustrated folder describes Dake Presses —send for a copy, today.

Write for this folder

Dake Engine Company, 636 Seventh St., Grand Haven, Mich.

DAKE
arbor and hydraulic
PRESSES

Single Leverage

Compound Leverage

Hand-Operated Hydraulic

Air-Operated Hydraulic

Elec-Draulic

YOU CAN BE **SURE**.. IF IT'S
Westinghouse

- **Eliminates Solenoid Friction and Misalignment**—Inverted clapper-type magnet balanced on knife-edge. No danger of sticking, jamming or misalignment.
- **Prevents Accidental Opening or Closing of Contacts**—Seesaw balance of clapper prevents accidental opening—kick-out spring prevents accidental closing.
- **Provides Uniform Line**—Appearance and construction, NEMA sizes 0 through 4.
- **Provides Positive Opening of Contacts**—Kick-out spring provides added force to open contacts. Does not depend on gravity alone to open.
- **Provides Straight-through Wiring**—Three line leads at top; three load leads at bottom with pressure-type terminals.
- **Provides Positive and Precise Overload Protection**—Snap-action, bi-metal DISC instead of "solder pots" or bi-metal strips.
- **Permits Front-removal of ALL Parts**—No special tools required.
- **Corrosion-resistant Parts All Plated**—Enclosure Bonderized.
- **Meets NEMA Standard Mounting and Wiring.**
- **Gives Quietest Operation**—Self-aligning magnet construction.

Tomorrow's Starter, TODAY!

New Westinghouse *Life-Line*starter*

FOR BETTER MOTOR PROTECTION, LOWER OPERATING COSTS

This all-new line of a-c motor starters is announced only after 6 years' actual trial service, backed by 40 years of user experience in building motor controls. Available in NEMA sizes 0 through 4 . . . to 100 hp, 600 volts. *Trade Mark J-30034-A

For prices and additional information on Life-Line-starters, contact your nearest Westinghouse representative. Or ask for a copy of booklet No. B-4677, Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

Westinghouse
*Life-Line*starter
TOMORROW'S STARTER—TODAY!

GET THESE TIME-PROVED

for the Tops in Threading Performance

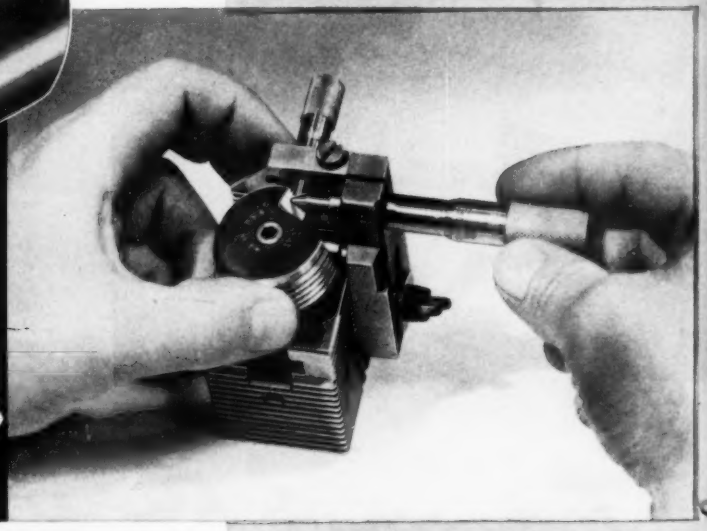
THEY'RE
– LIGHT-WEIGHT
– BALANCED
– PRECISION-BUILT

FOR LONG RUNS

with Long-Life Circular Chasers

Head Sizes: Straight Threads 1/4" to 9/16"
Pipe Threads 1/8" and 1/4"

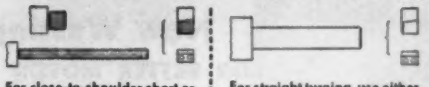
The famous Namco Double Barrel Micrometer Gauge insures identical check on uniformity of all chaser cutting edges, whether you use circular or adjustable blade chasers.



BOTH USE GROUND-THREAD PRECISION CHASERS

- Namco Vers-O-Tool Circular Chasers are regrindable through a full 270°—and Vers-O-Tool Adjustable Blade Chasers are designed to give more regrinds than conventional types, with the blade adjustable to proper cutting position for any type of material.
- One micrometer gauge serves both circular and adjustable types. A minimum adjustment of .003" for economical regrinds insures a freshly ground chaser always at correct cutting position.
- Vers-O-Tool Heads, too, are hardened and ground throughout.
- Quick removal and replacement of chasers or blocks is made by loosening only two screws.
- Vers-O-Tool Heads are provided with radial adjustment for wear on all sizes. Diametric adjustment is made by one screw. Both adjustments take less than two minutes.

YOU CAN USE



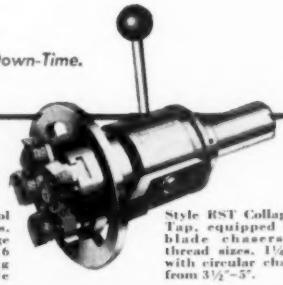
For close-to-shoulder short or long threads, use either Circular or Adjustable Blade Chasers.

For straight turning, use either Circular or Adjustable Blade Cutters.

Vers-O-Tools Give You More Threads per Dollar, with Closer Tolerances and Less Threading Down-Time.

Style DS Vers-O-Tool (Non-Revolving Type), 8 sizes, 3/16"–4 7/8" cutting range.

Style DR Vers-O-Tool (Revolving Type), 12 sizes, .056"–4 7/8" cutting range with circular chasers; 6 sizes, 3/16"–1 5/8" cutting range with adjustable blade chasers.

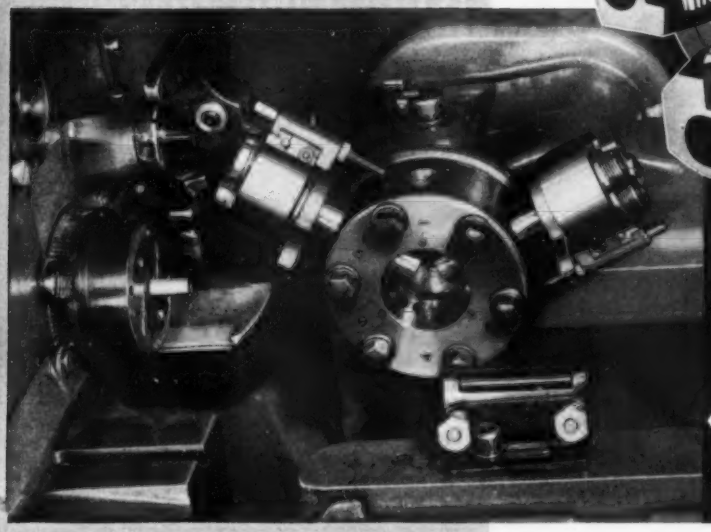


Style RST Collapsible Tap, equipped with blade chasers for thread sizes, 1¼"–4" with circular chasers, from 3½"–5".

DBS VERS-O-TOOL TWINS

on Brown & Sharpe Automatics

THEY'RE
– Designed Especially for B&S • Size 00 Size 0 • Size 2



FOR SHORTER RUNS

with Economical Adjustable Blade Chasers

Head Sizes: Straight Threads 3/8" and 9/16"
Pipe Threads 1/8" and 1/4"

Typical application of Namco Type DBS Vers-O-Tools on a Brown & Sharpe Automatic. One head is using Circular Hollow Mill Cutters; the other, Ground Thread Circular Chasers.

EITHER TYPE

For profile end-forming, use either Circular or Adjustable Blade Chasers.

For fine threads, Circular Chasers take you down to 200 pitch; Adjustable Blade Chasers, down to 60 pitch.

VERS-O-TOOL HEADS ARE DESIGNED FOR DOUBLE DUTY

- Namco Circular and Adjustable Blade Chasers are interchangeable, *using the same Vers-O-Tool Head*, size for size, on the 3/8"–9/16" blade types and on the 1/4" circular type.
- You can use Namco Circular or Adjustable Blade Cutters (interchangeable with same size chasers) for plain turning—and Vers-O-Tools leave no "cork screw" spiral when withdrawn from the work.
- Namco Vers-O-Tools provide close-to-shoulder threading because of positive, trigger-quick tripping action. Head is locked when it should be closed, always open when it should be open—*no blanks*.

For complete information on these *proved-in-use* Brown & Sharpe Type DBS Vers-O-Tools, and others in the famous versatile Vers-O-Tool Family, ask for Catalog D-49.

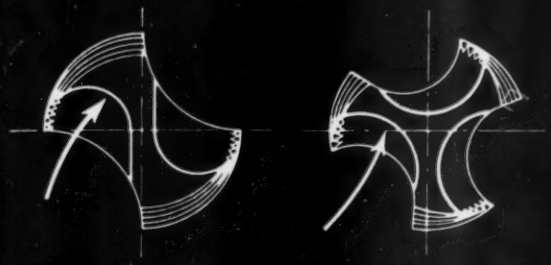
Stock Delivery on Heads and Chasers for All National Coarse and Fine and Taper Sizes. Special Adjustable Blade Orders, Usually One Week.

The NATIONAL ACME CO.

170 EAST 131st STREET • CLEVELAND 8, OHIO

Acme-Gridley Bar and Chucking Automatics: 1-4-6 and 8 Spindle • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • The Chronolog • Limit, Motor Starter and Control Station Switches • Solenoids Centrifuges • Contract Manufacturing

QUALITIES OF CRAFTSMANSHIP IN WINTER CHIP DRIVER TAPS

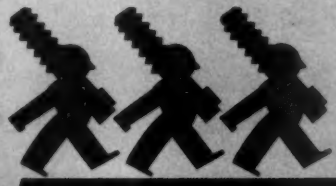


Precision Chip Driver Contours

Close size control of tapped holes can only be maintained when chip driver contours are held to precision limits. The chip driver contours on Winter Taps are accurate and uniform for free cutting action and high production. Other factors contributing to the superiority of Winter "Balanced Action" Taps are exact flute spacing, uniform flute contours, and accurate and concentric chamfers. The Winter line of threading tools also includes hand, machine screw, pulley, pipe, nut, and tapper taps, and a full complement of dies.

ALWAYS AT YOUR SERVICE

YOUR LOCAL DISTRIBUTOR carries a complete stock of WINTER Taps on his shelves—as close to your tapping problems as the telephone on your desk.



WINTER

WINTER BROTHERS COMPANY • Division of the National Twist Drill and Tool Company, Rochester, Michigan, U. S. A. Distributors in Principal Cities • Branches in New York, Detroit, Chicago, San Francisco

POINTS OF SUPERIORITY IN NATIONAL TWIST DRILLS

Correct Design

The design of National Twist Drills is the result of sound engineering and long field experience, taking into account several factors. The web must be thin enough to avoid undue center pressure; flutes must be large enough to allow free flow of coolant and chips. Cross sections must be strong enough for heavy duty work, while the helix angle must provide for efficient chip delivery and heat elimination. When all these conditions are met, the result is consistently efficient performance and long tool life—inherent properties of National Twist Drills.

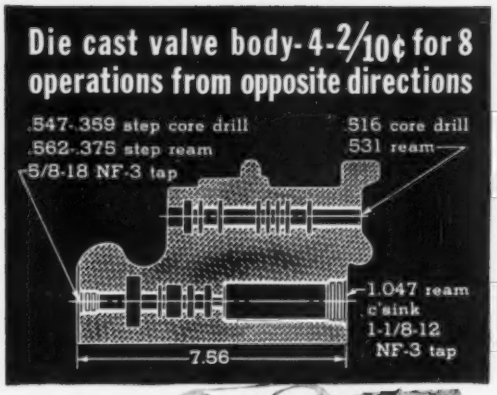
The complete National line of rotary metal cutting tools also includes reamers, counterbores, milling cutters, end mills, hobs, and special tools.

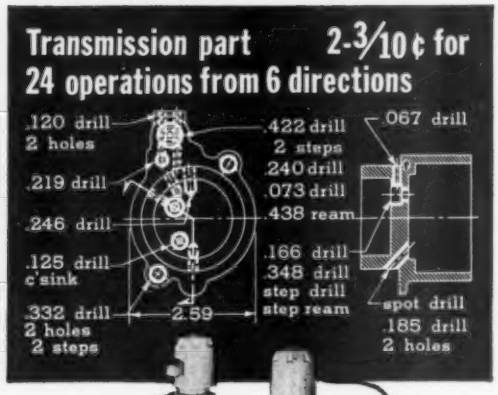
"CALL YOUR DISTRIBUTOR"

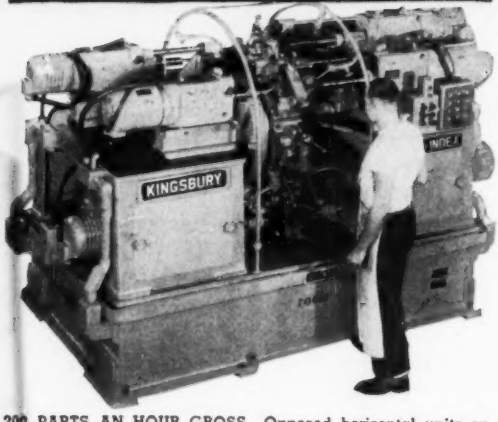
It is NATIONAL'S firm belief, based on long experience, that the local industrial distributor is the best source for all staple industrial needs—including NATIONAL Metal Cutting Tools.

National

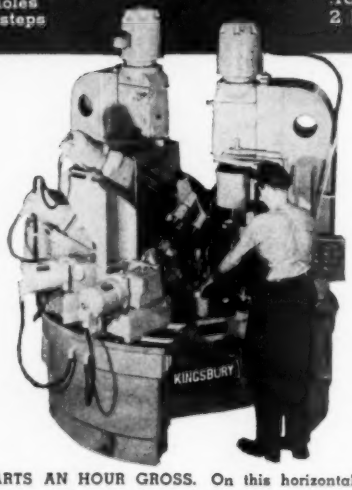
NATIONAL TWIST DRILL AND TOOL COMPANY
Rochester, Michigan, U.S.A. Distributors in Principal Cities • Factory Branches: New York • Chicago • Detroit • Cleveland • San Francisco







200 PARTS AN HOUR GROSS. Opposed horizontal units on this vertical indexing machine work on opposite faces of the part in the same chucking—three units on the left face and five on the right. Bushings guide all of the tools but the taps.



330 PARTS AN HOUR GROSS. On this horizontal indexing machine ten units work from six directions: vertical, angular, angular across the index table and horizontal—on the radial line and at two angles to it. Bushings guide 15 of the tools.

Costs go down with many

Automatic drilling and tapping machines work from several directions to close tolerances at low cost

Dear Sir:

Look at the number of operations per hour on these parts:

Die cast valve bodies	1280
Transmission parts	6336
Typewriter parts	2688
Throttle bodies	5440

And here are the average costs for man and machine per operation:

Die cast valve bodies	53/100¢
Transmission parts	10/100¢
Typewriter parts	14/100¢
Throttle bodies	19/100¢

We assumed three things: 1) 80% efficiency. 2) Each man's wage rate would equal the national average for such work. 3) The entire cost of each machine and tooling would be paid for after only 6000 hours of operation, a fraction of its useful life. No power or overhead.

You would probably figure these costs another way. But you would get the same result: Kingsburys give low unit costs on high production work.

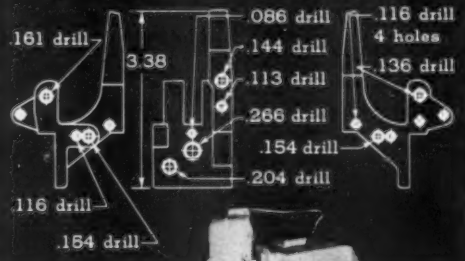
Why unit costs are low

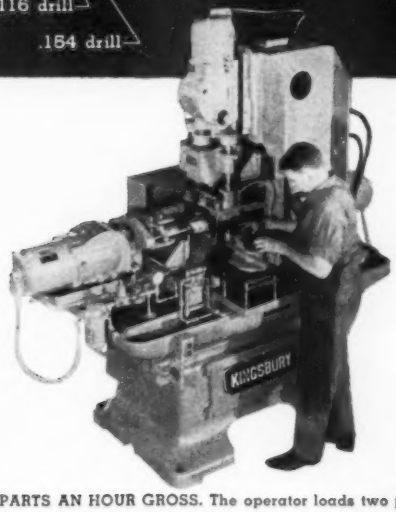
You need several general-purpose machines and several operators to keep up with one Kingsbury and one operator. That costs more, even if your machines would otherwise be idle. You pay for more operators, more supervision, more handling and more space. If your production is high enough to keep a Kingsbury busy most of the time, it would pay for itself in a matter of months.

A visitor argues a point

Somebody once disputed our claim of one person to a machine. He said, "I just saw a line of Kingsburys — big ones with 25 units apiece. All of them needed two chaps. One chap operated it. Another chap had to work full time hauling away chips." We said he exaggerated and stuck to our claim.

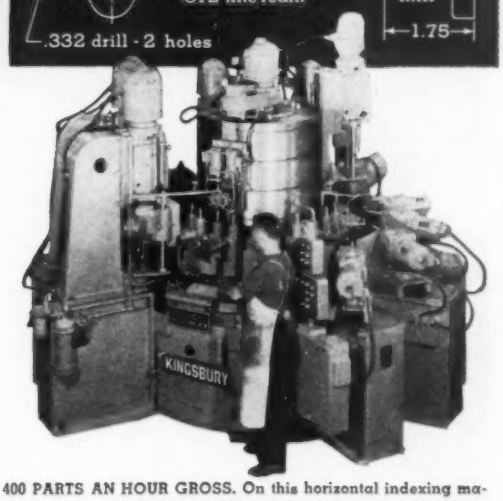
Typewriter part **1-9/10¢ for 14 operations from 3 directions**





240 PARTS AN HOUR GROSS. The operator loads two parts in the fixture. Three units drill five holes in one part and nine in the other part. The operator indexes the fixture 180° and the units complete both parts. Bushings guide all 14 of the drills.

Throttle body **3-2/10¢ for 17 operations from 5 directions**



400 PARTS AN HOUR GROSS. On this horizontal indexing machine with central column, 13 units work from five directions: vertical, underneath, horizontal, horizontal on the backstroke (milling) and horizontal off radial line. Bushings guide 9 tools.

operations per man-hour

Work from many directions

Each setup above uses a different basic machine. With each type, independent units can operate from different directions in the same chucking of the work. Because we can choose from so many basic machines and units, we can find efficient setups for many jobs.

Close tolerances

Bushings locate tools accurately. Guide bushings are in the fixtures or in plates that pilot to the fixtures. In the four Kingsburys shown, bushings guide 44 of the 63 tools. They do not guide taps, milling cutters or tools that locate from other operations.

Operations are in exact relationship. Each Kingsbury completes many operations in one chucking of the work.

Machining is uniform. Units with automatic cycles and cam feeds perform all operations.

Let's talk about your job

A specific proposal will show you if a Kingsbury can save you money. Just send a print of a high production part to our Mr. L. A. Carll. Tell him the operations and hourly output you need. Or ask him for free bulletins that show 53 setups.

Sincerely,
Kingsbury Machine Tool Corp.
35 Laurel Street, Keene, N. H.

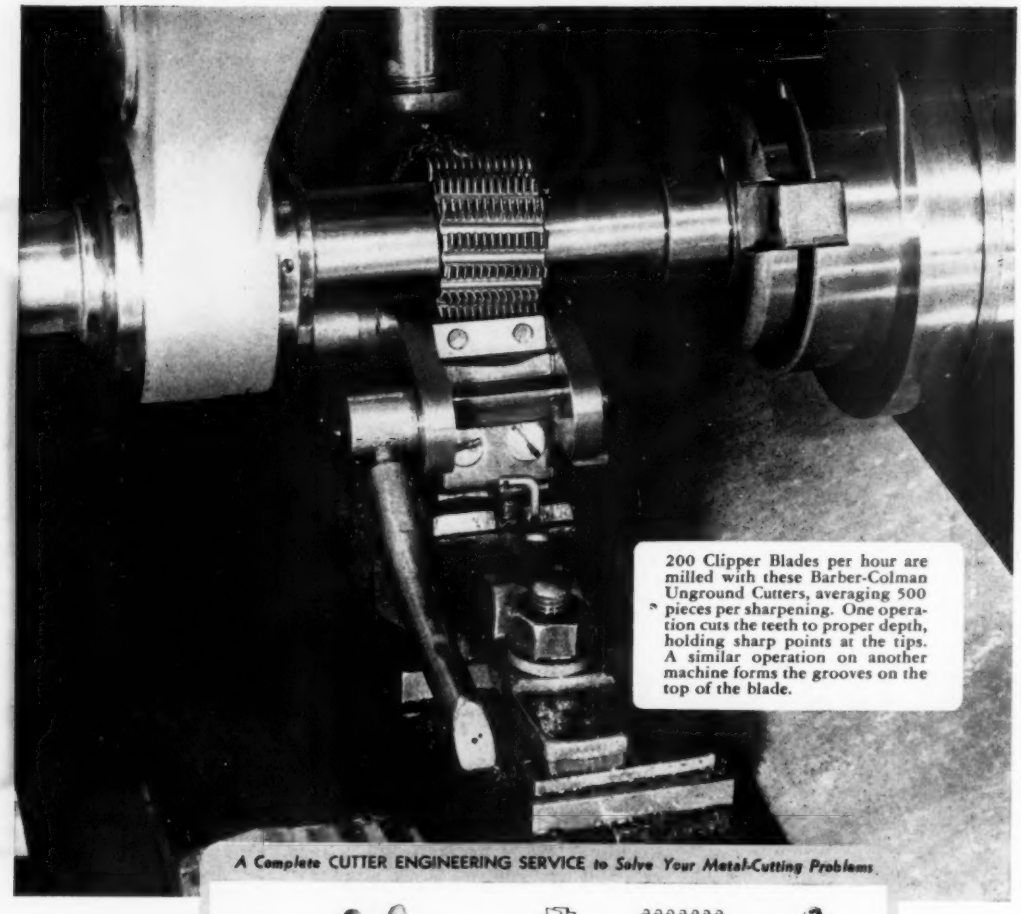
P.S. Don't get the idea we do only *tough* jobs. We can save you money with simple setups too. Just ask us.

KINGSBURY
AUTOMATIC DRILLING & TAPPING MACHINES
for Low-Cost High Production

BARBER-COLMAN

FORMED CUTTERS

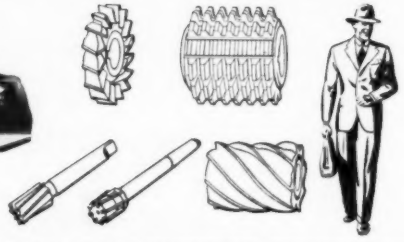
Mill Deep, Fine Tooth Forms



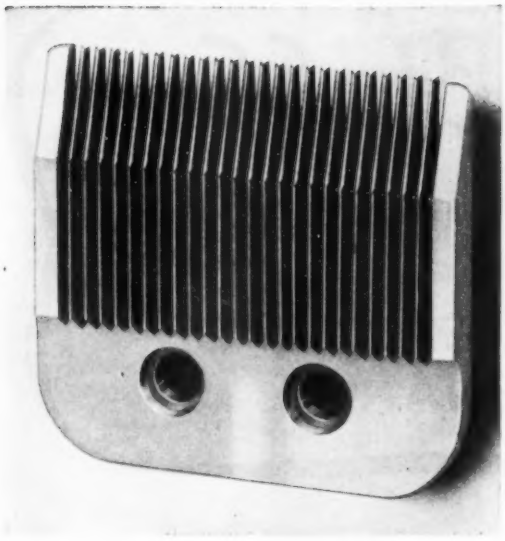
200 Clipper Blades per hour are milled with these Barber-Colman Unground Cutters, averaging 500 pieces per sharpening. One operation cuts the teeth to proper depth, holding sharp points at the tips. A similar operation on another machine forms the grooves on the top of the blade.

A Complete CUTTER ENGINEERING SERVICE *to Solve Your Metal-Cutting Problems*

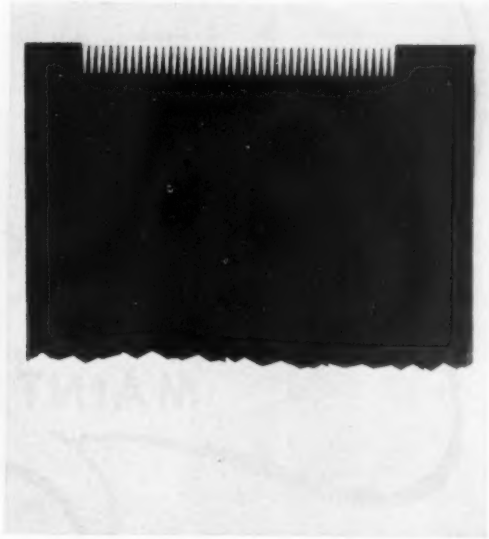
BARBER COLMAN ®



JOB-ENGINEERED DESIGN • FULL LINE OF STANDARD TOOLS • FIELD SERVICE



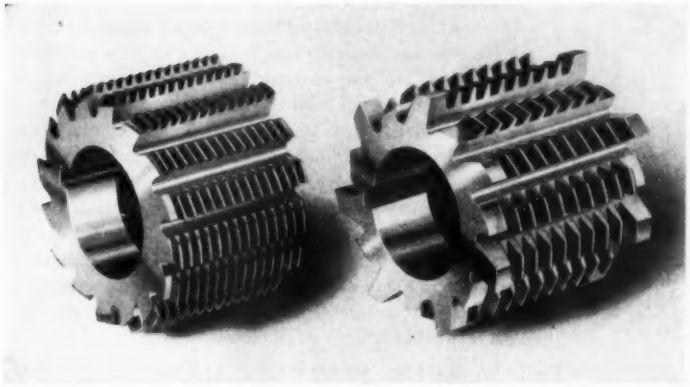
▲ Clipper blade showing depth of form, with teeth ranging from .012″ to .018″ thick depending on blade style. One operation cuts the teeth and a second forms the grooves on top of the blade. Other Barber-Colman cutters are also used to mill the angle, sides and back of the blade.



▲ Enlarged section of teeth indicates the cutter problems in milling long thin teeth with sharp tips. Cutters are designed with intermittent rows of teeth to give extra tooth strength and to assure uniformly sharp points. This design assures consistent accuracy and long life.

Cut Thin Sections...Hold Sharp Points With Maximum Accuracy and Production

▼ Pitch of cutter teeth is held within .0005″. Cutters are unground with straight or helical gashes. The pitch of one cutter must match the pitch of the other to assure absolute alignment of grooves with teeth on the blade. Barber-Colman design assures duplication of accuracy whether cutters are ordered in sets or individually at intervals.



FOR

Those Tough Milling Problems

YOU SUPPLY THE FORM!...

WE'LL DESIGN THE CUTTERS

TO

COMBINE CUTS
PROLONG TOOL LIFE
SPEED OPERATIONS
DUPLICATE ACCURACY
MAKE THE JOB EASIER

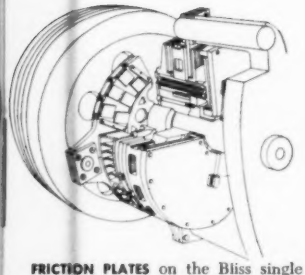
SEND BLUEPRINTS FOR QUOTATION TO DEPARTMENT AM.

Barber-Colman Company

GENERAL OFFICES AND PLANT, 411 ROCK STREET, ROCKFORD, ILLINOIS, U.S.A.

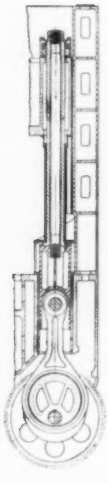
NEW BLISS 4 POINT PRESS

FACES THE REALISM OF MAINTENANCE



FRICTION PLATES on the Bliss single disc clutch are arranged for rapid heat dissipation. When worn, you can replace them quickly without disassembling the clutch.

23 DUPLICATES of this first installation in a leading automotive plant are now being built in Bliss plants.



UNUSUALLY LONG CONNECTIONS hold side thrust to a minimum. This drawing shows one entire side of the press.

Manufacturers using assembly-line methods to produce large stampings can save precious maintenance time with Bliss' new 4-point presses. All major assemblies—gearing, connections and clutch—are designed for faster, more convenient adjustment and part replacement.

Several hours are saved in shaft removal alone through a bearing arrangement which permits the shafts to be dropped straight down. And the clutch requires no adjustment for wear. Long-wearing friction plates can be replaced without disassembling the clutch. Extremely long slide adjustments can be made quickly through a motor-driven adjusting mechanism meshing with external threads of the sideposts. Driving gears, located beneath floor level in a pit for convenient maintenance, are protected with enclosed sideposts which prevent dirt and scrap from creeping into drive box.

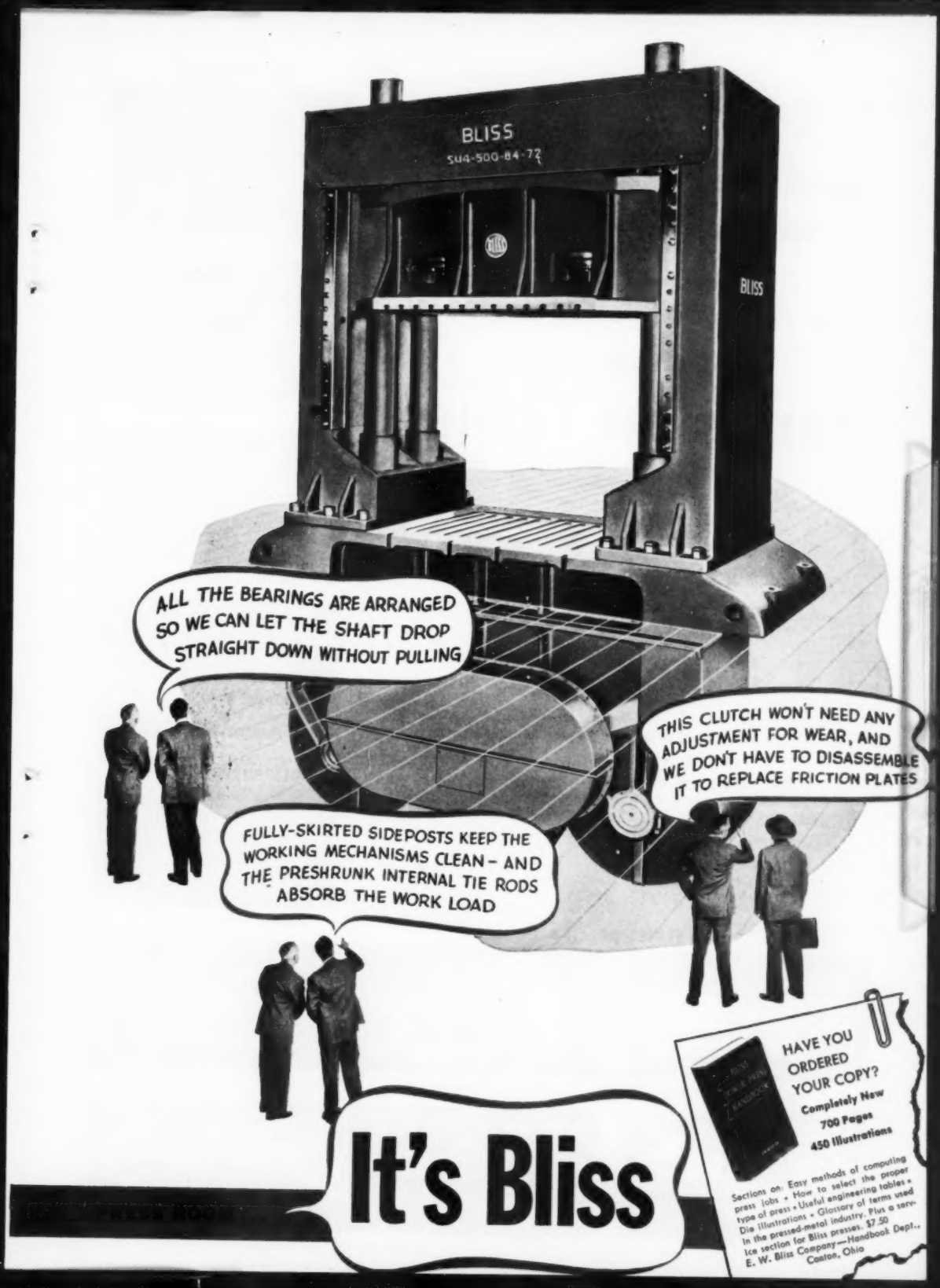
Available in sixty-three standard sizes with specifications established by the Joint Industry Conference, these Bliss presses feature an eccentric drive, unusually long connections and a rigid frame construction with full box sections and wide bases.

Whether your requirements involve one-, two- or 4-point presses, overdrive or underdrive construction, Bliss' unrivaled experience in the design and manufacture of heavy-tonnage presses is your assurance of low-cost, trouble-free service. We'll be glad to send you full details.

E. W. BLISS COMPANY, CANTON, OHIO

Mechanical and Hydraulic Presses, Rolling Mills, Container Machinery

FROM A SINGLE PRESS TO A GIVEN JOB TO A COMPLETE


BLISS
SU4-500-84-72
BLISS
ALL THE BEARINGS ARE ARRANGED SO WE CAN LET THE SHAFT DROP STRAIGHT DOWN WITHOUT PULLING
THIS CLUTCH WON'T NEED ANY ADJUSTMENT FOR WEAR, AND WE DON'T HAVE TO DISASSEMBLE IT TO REPLACE FRICTION PLATES
FULLY-SKIRTED SIDEPOSTS KEEP THE WORKING MECHANISMS CLEAN – AND THE PRESHRUNK INTERNAL TIE RODS ABSORB THE WORK LOAD
It's Bliss
HAVE YOU ORDERED YOUR COPY?
Completely New
700 Pages
450 Illustrations
Sections on: Easy methods of computing press jobs • How to select the proper type of press • Useful engineering tables • Die illustrations • Glossary of terms used in the pressed-metal industry. Plus a service section for Bliss presses. $7.50
E. W. Bliss Company—Handbook Dept., Canton, Ohio

Basic Parts of America's Industrial Power...

The Production-Tested Legion of
MONARCH PRECISION LATHES

Here's visible evidence that, whatever your turning problems, there's a specific Monarch Lathe to do the job. And, being a Monarch Lathe built to Monarch standards, you can count on peak production at minimum cost.

You won't see every Monarch Lathe on these pages —we couldn't get them all in. But note the variety. Note the *3* types of tracer controls—a choice that only Monarch offers. And please note this: regularly, since 1909, Monarch lathes have been first to feature almost every major lathe improvement later considered as standard for the industry. You're ahead of the field with Monarch—in longer life, in improved accuracy, in lowered costs.

For complete information—with performance data, photos and case histories—we have prepared specialized Bulletins. Just indicate your interest, and we'll send the ones you want. *The Monarch Machine Tool Company, Sidney, Ohio.*

10" MACHINES

10" x 20" Model EE Toolmaker's Lathe

10" Precision Manufacturing Lathe

10" Precision Manufacturing Lathe with Turret

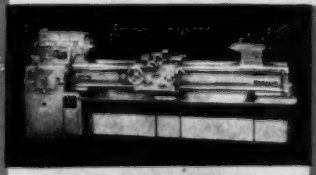
The Speedi-Matic

ROLL TURNING LATHES

Monarch Heavy Duty Roll Turner

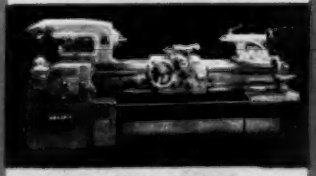
Model N Roll Turning machine

SERIES 60 LINE

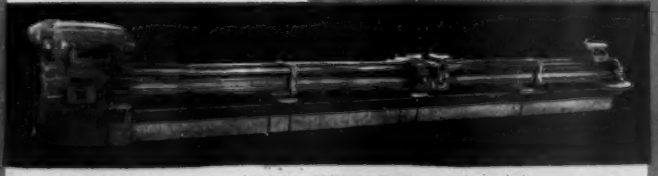


12" Series 60 Toolmaker's Lathe

16" Series 60 Engine Lathe



20" Series 60 Toolmaker's Lathe



20" Series 60 Engine Lathe

MONA-MATIC

Model 20 Mona-Matic

Model 15 Mona-Matic with Magazine Load

Model 15 Mona-Matic with R-F cycle

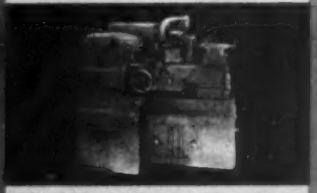
UNI-MATIC

Uni-Matic with standard Uni-Mats

Uni-Matic with Air-Gage Tracer Uni-Mat

Uni-Matic with hydraulic table

TRACER CONTROLS

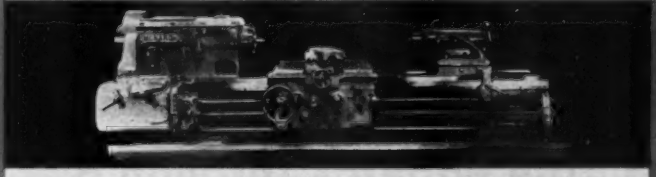


10" Precision Lathe with Air-Gage Tracer

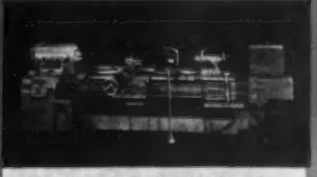
Series 60 Engine Lathe with Air-Gage Tracer

Heavy Duty Engine Lathe with Air-Gage Tracer

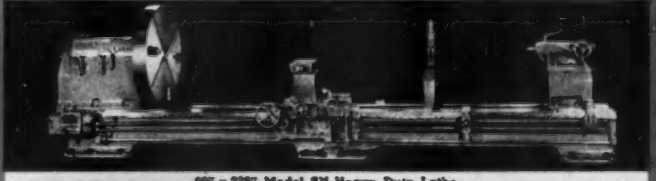
HEAVY DUTY LATHES



32" Model NN Heavy Duty Lathe



Series 60 Engine Lathe with Motor-Trace



60" x 228" Model SN Heavy Duty Lathe

Series 60 Engine Lathe with Monarch-Keller

13" Precision Toolmaker's Lathe

Model 70 Sensitive Precision Toolmaker's Lathe

SHAPEMASTER ENGRAVER

Shapemaster Engraver

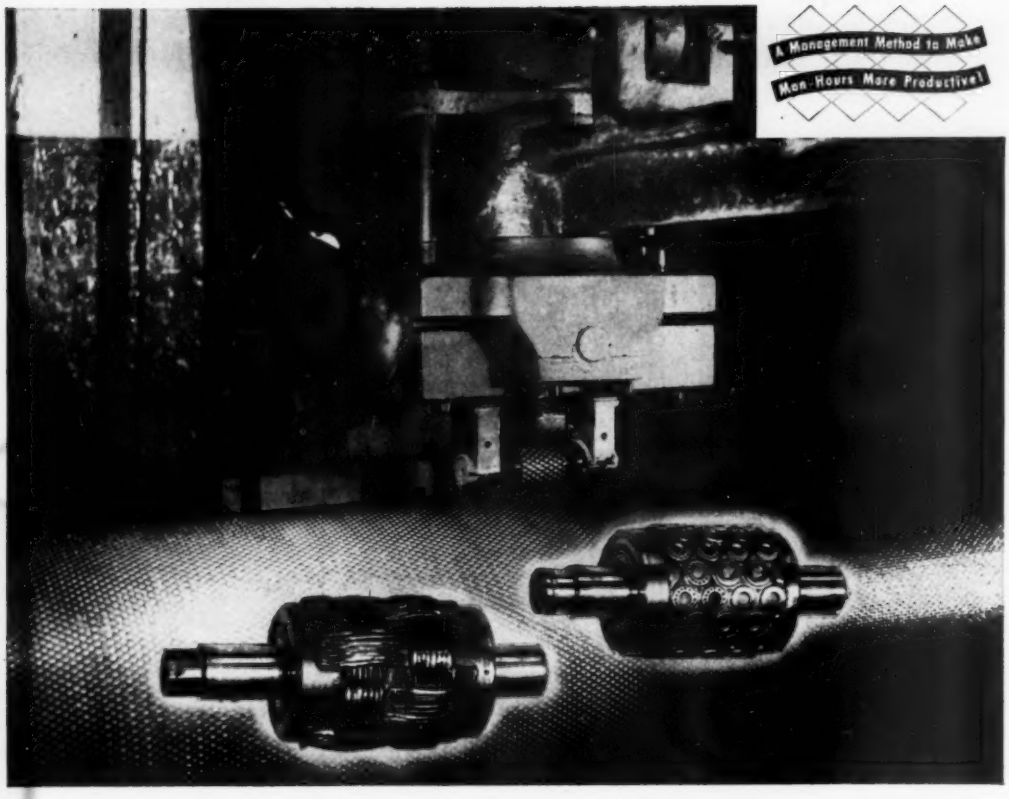
FOR A GOOD TURN *FASTER*—TURN TO MONARCH

Monarch

ACCURACY • ECONOMY • LONG LIFE

TURNING MACHINES

The MONARCH MACHINE TOOL COMPANY, Sidney, Ohio



How to Put Delicate Patterns Through a 5-Ton "Wringer", Successfully

These knurling mills, made from No. 11 Special (Water-Hard) Tool Steel, press artistic patterns into large steel rolls for embossing cloth, paper and plastic. Here's what was required of the tool steel: It had to be hard enough to prevent upsetting; tough enough to prevent delicate edges from breaking under operating pressures up to 5 tons. Patterns on the mills were quite fragile and sections as deep as 1/16" could not collapse. Further, the steel had to heat treat with very little warpage.

But picking the proper steel wasn't as tough as you may imagine. For the Carpenter Matched Set Method not only indicated the one *best* steel for the job but enabled production management to "call its shots" . . . have the mills produce the required number of patterns on schedule, with less costly downtime.

For any plant making or using tools and dies, the Matched Set Method offers even more advantages than simplified selection. You benefit from lower tool steel inventories, heat treating economies, simplified toolroom and production procedures. To discover how it can work for you in your plant, write for the new booklet "How to Get Better Tool and Die Performance". THE CARPENTER STEEL CO., 109 W. Bern St., Reading, Pa.

Export Department: Carpenter Steel Co., Reading, Pa. — "CARSTEELCO"

Carpenter

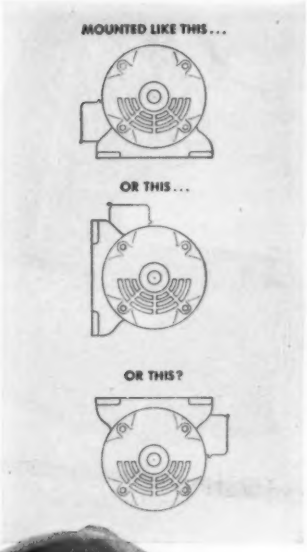
MATCHED TOOL & DIE STEELS

More than top-grade steels . . . a Method to keep tooling and production on schedule!

For your convenience, Carpenter carries warehouse stocks in principal cities throughout the country

YOU CAN BE SURE.. IF IT'S
Westinghouse

Is your motor *really* dripproof?



. . . AT ANY ANGLE OF MOUNTING— Do you see a ventilating opening in the frame? Then the motor is probably not dripproof when side wall or ceiling mounted. You need a special motor for these mounting positions . . . with special protection over frame openings. But . . .

You can save the costs of specials with Life-Line motors. Solid frame construction eliminates frame openings. All ventilation is accomplished through the end brackets. Simply rotate the 4-position brackets and the Life-Line is dripproof—for side wall or ceiling mounting.

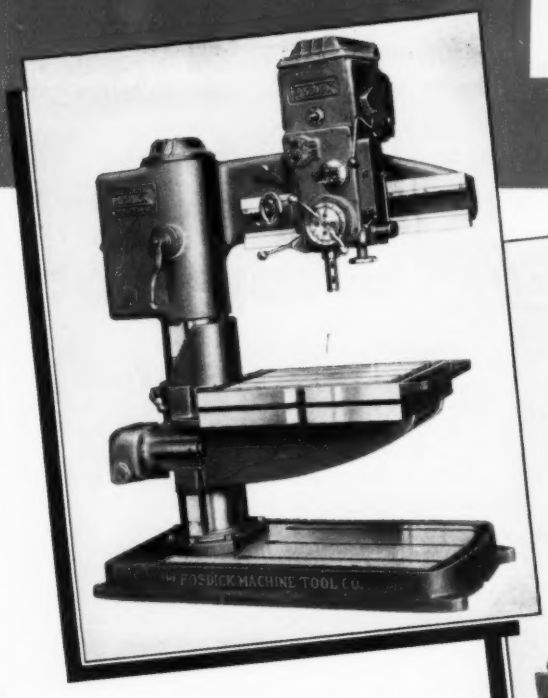
Dripproof conduit box can be rotated also. Plenty of knockouts give maximum possible connections. And, because a Life-Line motor needs no further lubrication, you can crowd it into cramped quarters . . . mount it in "hard-to-get-at" locations—and forget it. Thus, you get maximum mounting flexibility for difficult mounting problems.

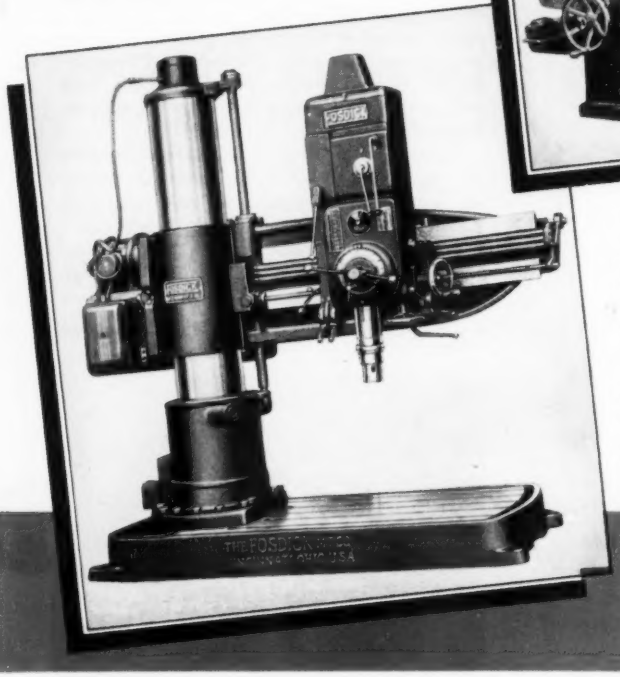
It costs no more to get these "special" features in a standard motor. Simply specify Life-Line as the drive for your equipment. Ask your local Westinghouse representative for details and a copy of booklet B-3842, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-21583-A

If you figure LIFE-COSTS . . . you'll figure LIFE-LINE

Westinghouse
Life-Line
Motors
INDUSTRY'S LEADING MOTOR

FOSDICK
for GREATER





TOP TO BOTTOM:

- The New Fosdick Sensitive Radial built in 3' and 4' sizes.
- Hydraulic Radial built in 11" to 19" columns.
- Fosdick Automatic Positioning Machine.

LEFT TO RIGHT:

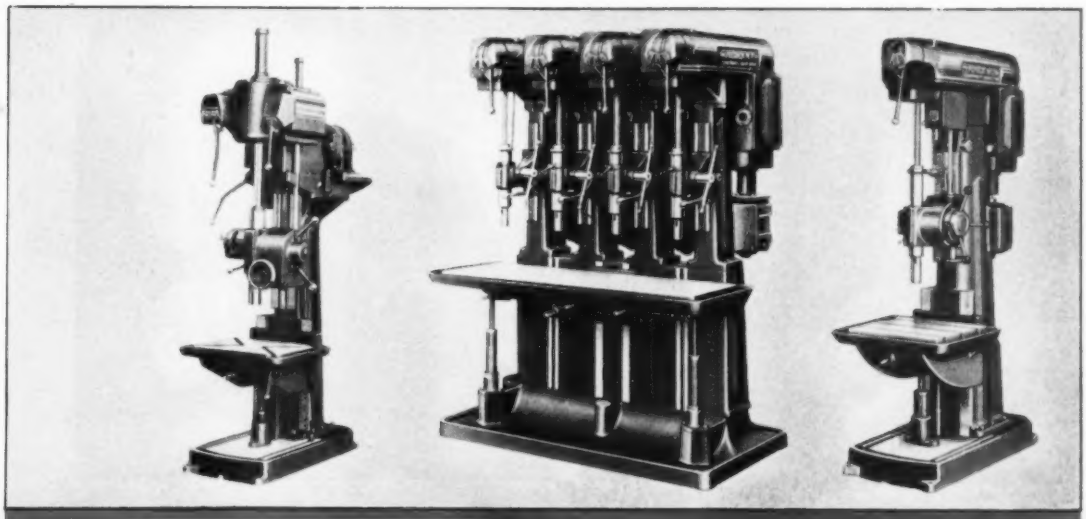
- Fosdick Economax Upright Drill furnished with box and round columns.
- Fosdick four spindle High Speed Drill.
- New 21" BM Fosdick Upright Drill.

PRECISION MACHINE TOOLS PRODUCTION at LOWER COST

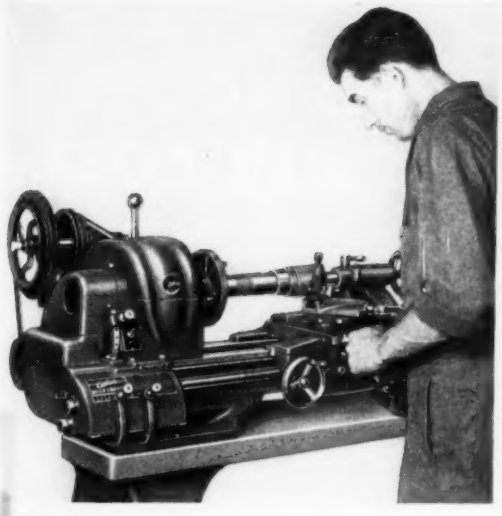
●Here is a line of Machine Tools designed for high speed economical production. Included in this modern line of FOSDICK Machine Tools are machines for drilling—reaming—boring—facing and similar operations. FOSDICK JIG BORERS have gained wide acceptance for precision operations, in tool rooms and tool and die shops. HYDRAULIC RADIAL DRILLS are available in types and sizes to meet your most exacting requirements. The new SENSITIVE RADIALS, which combine the advantages of both the Sensitive and Radial drills, provide a high speed sensitive machine for radial work.

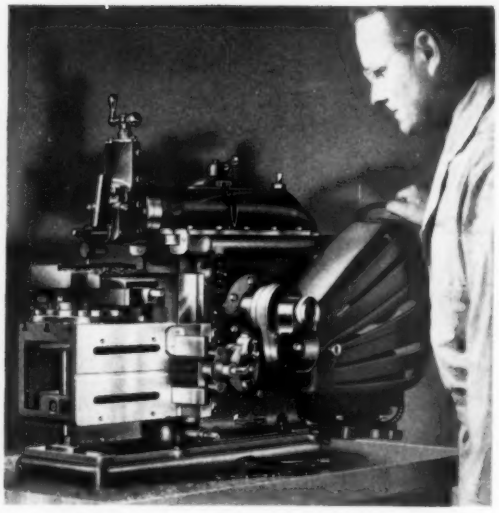
Also included in this line are SENSITIVE DRILLS in single and multiple spindles up to six. Standard Sensitive Drills are equipped with six or nine speeds. Medium and heavy duty UPRIGHT DRILLS are obtainaable in both box and round column types. Special production features can be added to any one of the Fosdick Machines.

Consult a Fosdick Representative or write for Fosdick Bulletin AMFL.



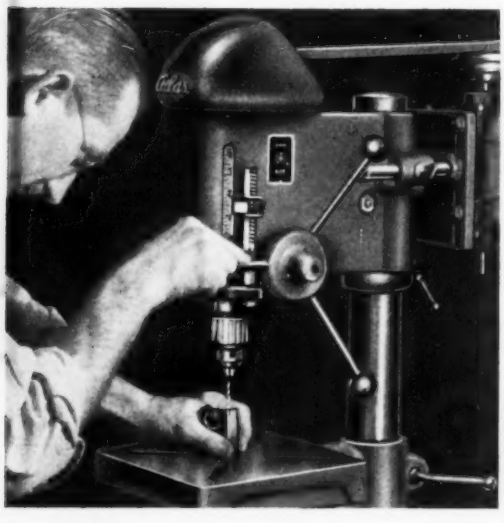
FOSDICK MACHINE TOOL CO.
CINCINNATI 23, OHIO





Atlas 10" lathes—24" or 36" between centers—provide a selection of 16 speeds, instantly reversible power cross and longitudinal feeds as standard equipment, plus Timken tapered roller bearings for high speed production with lasting accuracy.

Atlas 7" shapers have *all* the rugged construction, materials, and operating features of large shapers built down to size—plus Timken tapered roller bearings. You should see the many exclusive Atlas features.



The new Atlas drill presses—floor, bench, and multiple spindle—come in 50 different high and slo speed models, with many new exclusive features for greater accuracy and longer service life.

Atlas milling machines—Timken bearing equipped—can handle all small parts operations with precision and speed, and relieve your large machines of such work. Atlas is the only truly low-cost miller.

40TH YEAR Atlas

DEPENDABLE QUALITY TOOLS

PERFECT For LOW-COST SMALL PARTS PRODUCTION

Ideal for Tool Rooms, Maintenance, Development Labs

You can make substantial savings *every day* with Atlas tools on the job to cut costs and speed small parts machining operations. There are four main reasons why.

1. They are *ruggedly built,* with an extra margin of power for heavy cuts. They incorporate all the good features of large machines, scaled down for precision work on small parts.
2. The lathes, millers and shapers are *Timken tapered roller bearing equipped* to maintain accuracy on round-the-clock schedules. *Atlas are the only low-cost tools with Timken bearings.* Drills have 4 ball-bearing "floating drive" design.
3. They are quick and easy to set up — save many hours' set up time each month.
4. *Low in cost, they keep new tool investment at a minimum* — save power costs, too. What's more, automatic devices have also been developed that can be added to Atlas tools giving you high production machines for but a few hundred dollars.

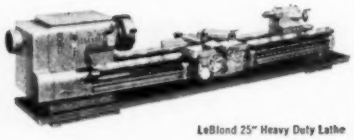
Whether your need is for small parts production machines, or precision workmanship in any of your other plant departments, get the complete story about Atlas tools. Delivery schedules currently are good. Send for latest catalogs and name of nearest dealer today.

40TH YEAR Atlas **ATLAS PRESS COMPANY**

104 N. PITCHER ST. • KALAMAZOO, MICHIGAN

LE BLOND proudly presents

we mesh fewer gears to give you greater power on...



LeBlond 25" Heavy Duty Lathe

LeBLOND HEAVY DUTY LATHES

The headstock design of LeBlond Heavy-Duty Lathes incorporates the free-running principle, with hardened and ground steel gears.

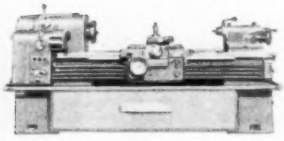
Result? Fewer gears in mesh at any given spindle speed to minimize no-load friction horsepower. More *smooth* power for your production work. Longer life from your LeBlond Heavy-Duty Lathe.

In addition to the Heavy-Duty Engine Lathe sizes shown, LeBlond builds a 20" Medium Duty Engine Lathe and accurate, versatile Toolroom Lathes in 12", 14", 16" and 20" sizes.

12"
14"
16"
20"
25"
32"

NOTE: *LeBlond also builds 40" and 50" Heavy-Duty Engine Lathes.*

you can't stump this toolroom expert



LeBLOND RT TOOLROOM LATHE

To our knowledge, the exclusive LeBlond 16" RT Toolroom Lathe has never been stumped! Infinitely variable speeds from 6 to 1500 r.p.m. Feeds from .0007" to 2.064". Threads from ¼ to 120—American, diametral, module and metric. 4-directional rapid traverse. Automatic chasing stop.

The RT is also built in a 16" Heavy Duty Engine model with 16 single-lever controlled speeds from 30 to 1537 r.p.m. 4-directional rapid traverse. Reverse to leadscrew at apron. Automatic chasing stop.

RT

BUILT-IN FEATURES

- 4-directional rapid traverse
- Combination gear and belt drive
- Automatic chasing stop
- Reverse to leadscrew at apron
- Single-lever positive-jaw feed control
- Single-lever speed choice
- Automatic lubrication through headstock, feedbox, apron

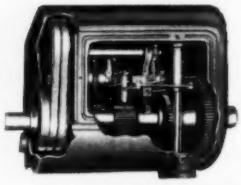
toolroom lathe

- Variable speeds—6 to 1500 r.p.m.
- 90 feeds—.0007" to 2.064"
- 90 threads—¼ to 120, American, module, metric
- Start-stop-reverse spindle control at apron
- 7½ horsepower motor

engine lathe

- 16 speeds—30 to 1537
- 60 feeds—.0013" to .230"
- 60 threads—2 to 120
- 15 horsepower motor

THIS LATHE USES ITS HEAD to give you full power at all twelve speeds from 28 to 1800 r.p.m.



LeBLOND DUAL-DRIVE

Dual Drive headstock design combines belt and gear drive to give you the widest range of speeds in the medium-price class—all at full horsepower.

Result? Smooth *full* power at high speeds—ideal for carbide and fine-finish turning. Rugged *full* power at low and intermediate speeds—for fast, efficient rough turning. Add convenient, single-lever speed control and the widest feed range in its class—and you have a lathe that does more jobs, faster, better, easier than any comparable machine.

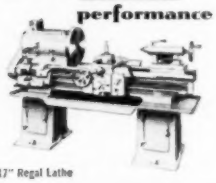
15

DUAL-DRIVE FEATURES

- 15" swing
- Combination belt and gear drive
- Twelve speeds from 28 to 1800 r.p.m.
- Ninety-six feeds from .0004" to .106"
- Forty-eight threads from 4 to 224
- Single-lever speed control
- Totally enclosed feed box
- Electric brake, forward and reverse spindle control at apron
- Single-lever positive jaw feed control
- Automatic lubrication through headstock and feed box
- Hardened steel gears and anti-friction bearings
- Multiple automatic length stops
- One-piece apron
- Hardened and ground replaceable steel bed ways
- Taper key drive spindle nose

LeBlond Dual-Drive Lathe

these heavy-duty features improve light-duty performance on...



LeBlond 17" Regal Lathe

LeBLOND REGAL LATHES

- Geared Headstock
- Quick-Change Feed Box
- Separate Leadscrew and Feed Rod
- Taper Key Drive Spindle Nose
- One-Piece Apron

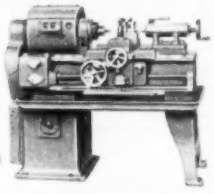
Why can LeBlond give you the most rugged, dependable performance in the light-lathe class? Because only LeBlond can tap the vast engineering and production facilities of a plant building 76 lathe models. Add to this LeBlond's 63 years of leadership in machine tool design and production . . . and you have the LeBlond *combination* for top value in lathes.

13"
15"
17"
19"
21"
24"

NOTE: *LeBlond also builds Regals in these models:*
13" Bench • 17", 19", 21", 24" Gap
17/28" and 19/30" Sliding Bed Gap

these LATHES for 1951

here's a production lathe with a stripped-down price tag



LeBlond 13" Rapid Production Lathe

LeBLOND "RAPID PRODUCTION"

The price tag is the *only* "stripped-down" feature about this lathe. It was designed *especially* for your high-production turning and facing to give you a production machine that will handle a *variety* of work within the range *you* choose.

The 13" Rapid Production Lathe may be ordered with your choice of three headstocks that give you any of the following speed ranges:

6 speeds from	68 to 400 r.p.m. 102 to 600 r.p.m. 200 to 1200 r.p.m.
4 speeds from	450 to 3600 r.p.m. 600 to 3600 r.p.m. 600 to 1800 r.p.m.
2 speeds	600 and 1200 r.p.m. 900 and 1800 r.p.m. 1800 and 3600 r.p.m.
Single speeds	900 r.p.m. 1800 r.p.m. 3600 r.p.m.

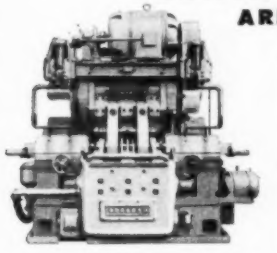
13"
17"
20"

PRODUCTIVE ATTACHMENTS

- Automatic back facing attachment
- Lever draw-in attachment
- Wheel draw-in attachment
- Air operated chuck
- Air operated tailstock
- Quick-acting, lever operated tailstock
- Special arbors
- Compound rest
- Plain and compound connected rests
- Plain connected rests
- Plain rest and turret tool post connected
- Taper attachment
- Standard multiple tool blocks
- Turret tool post on carriage
- Cross and length stops
- Chip Pan
- Motor driven coolant pump

17" and 20" machines are available with similar speed range choices

9 out of 10 crankshaft lathes built today ARE LeBLONDS



LeBlond 1LB Crankshaft Lathe

LeBlond has been *the* pioneer and developer of modern crank-turning equipment since 1905.

LeBlond makes Lathes for roughing and finishing all elements of any crank—small air compressor types, automotives and huge diesel engine crankshafts. The complete line includes automatic Lathes for mass production and universal Lathes for handling a variety of cranks.

LeBlond has the right machine for your job. Send your specifications in today for an estimate. Remember, more than 9 out of 10 Crankshaft Lathes built today are LeBlonds!

7AC3 automatic rough-turning of line bearings

DH automatic finishing of line bearings

1LB automatic rough and finish turning of line bearings, flange and stub ends

3LB same as 1LB but larger

6AC automatic cheeking and rough or finish turning pin bearings

No. 1 universal crankshaft and automatic

24" UNIVERSAL HEAVY DUTY universal for cranks of max. 3" throw

36" UNIVERSAL HEAVY DUTY universal for cranks of max. 4" throw

LeBlond also builds

SLIDING BED GAP LATHES—**16"/38", 25"/50" and 32"/60"**

For a variety of parts with unusual or irregular projections such as shafts with large flanges, odd shaped blocks, large face diameters and many similar jobs requiring a flexible gap and center distance.

PLAIN BED GAP LATHES—**12", 14", 16", 20", 25" and 32"**

For jobs as above where adjustable gap is unnecessary.

HOLLOW SPINDLE LATHES—**16", 27" and 30"**

For oil country requirements or any work requiring large openings through the spindle.

AUTOMATIC LATHES—**12" 16" and 3AC**

For completely automatic machining with multiple tooling.

"HYDRA-TRACE" DUPLICATING ATTACHMENT

For smooth hydraulic turning and facing of a great variety of contours.

NO. 2 CUTTER GRINDER

Industry's standard for cutter sharpening and a wide range of toolroom grinding work.

COMPLETE LINE OF LATHE ATTACHMENTS

Sixty-four years of leadership in the design and production of machine tools stand behind every one of the 76 lathe models built by LeBlond. For the *right* lathe for your job, call your nearby LeBlond Distributor or write—

R. K. LeBLOND MACHINE TOOL COMPANY
Cincinnati 8, Ohio

Sales Offices in New York, Chicago and Detroit.

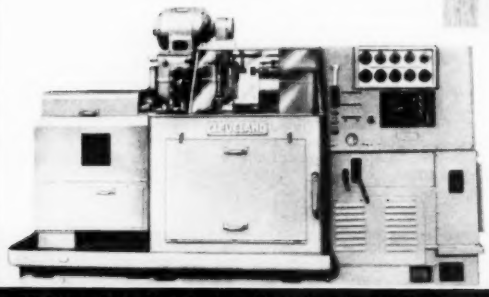
LeBLOND of Cincinnati

World's largest builder of a complete line of lathes.

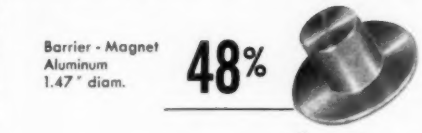
HERE'S HOW PRODUCTION WENT UP...WHEN A NEW CLEVELAND *DIALMATIC* WENT IN!

Eclipse-Pioneer Division, Bendix Aviation Corporation, blanks these parts on a new 2½" Dialmatic Cleveland.

they report these increases in production



Model AB Dialmatic Cleveland 2½" Single Spindle Automatic (Also supplied in 3" capacity)



Barrier - Magnet Aluminum 1.47" diam. **48%**

17% Nut Blank E-8740 Steel 2⅛" diam.

Rotor Shaft Stainless Steel 1.46" diam. **33%**

71% Adapter Aluminum 1.92" diam.

End Cap Aluminum 1.95" diam. **157%**

30% Bellows Bottom Clamp, Brass 1.45" diam.

Clamp Ring Aluminum 1.81" diam. **35%**

And these are typical—not unusual—production increases. *Many* manufacturers have stepped up productivity by replacing prewar automatics and turret lathes with new Dialmatic Clevelands. How much will *your* production benefit? Let a Cleveland Engineer show you. Send us samples or part prints. There is no obligation, of course.

Remember . . . *Clevelands Cut Costs*

THE CLEVELAND AUTOMATIC MACHINE COMPANY

4928 Beech Street
Cincinnati 12, Ohio

SALES OFFICES: CHICAGO
CLEVELAND • DETROIT
HARTFORD • NEWARK

Manufacturers of a Complete Line of Single Spindle Automatic Screw Machines and High Pressure Hydraulic Die Casting Machines

It takes a tough, rugged KING

(*Right*) 72" KING Vertical Boring & Turning Machine at Caterpillar Tractor Co., Peoria, Illinois. Piece being machined is a side shift rack for "Caterpillar" No. 12 Motor Grader.

(*Below*) "Caterpillar" DW 20 4-wheel Diesel Tractor with W20 Wagon. This new high-speed, long-haul, high-capacity, earth-moving combination is the result of five years of intensive research and development. Sturdy parts for both units are precision machined in record time on "Caterpillar's" big, husky KING.

to build *mountain-moving "Cats"!*

WRITE FOR NEW CATALOGS

New illustrated KING catalogs give detailed description of machines and complete specifications. Catalog K-1 features machines sizes 30", 36" and 42"; K-2, sizes 52", 62" and 72"; K-3, sizes 84" and 100"; K-4, sizes 120" and 144".

Men who design and manufacture tough, big-muscled "Caterpillar" products require the same qualities of rugged power and stamina in the machine tools that build them. This 72" New-Series KING has the power, rigidity and range of speeds that make it ideally suited to "Caterpillar's" production requirements.

Here, as in other leading industries, New-Series KING Vertical Boring & Turning Machines are consistently proving their ability to cut costs and improve quality on the complete range of boring, facing, and turning work. Investigate KING's cost-cutting advantages. Ten sizes–30" to 144"—the *widest* size range in the field.

American Steel Foundries

KING MACHINE TOOL DIVISION

CINCINNATI 29, OHIO

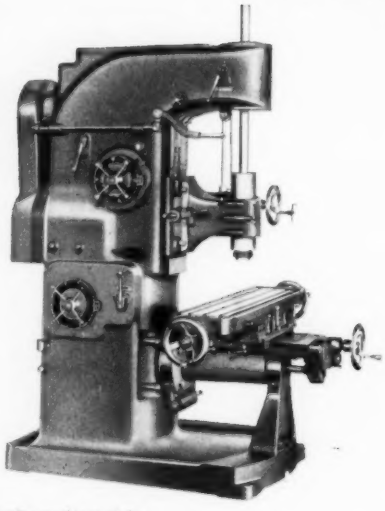
Builders of King Vertical Boring & Turning Machines and Sebastian Lathes

Here May Be Your Answer To

KNIGHT EQUIPMENT OFFERS

For Savings In Manhours And

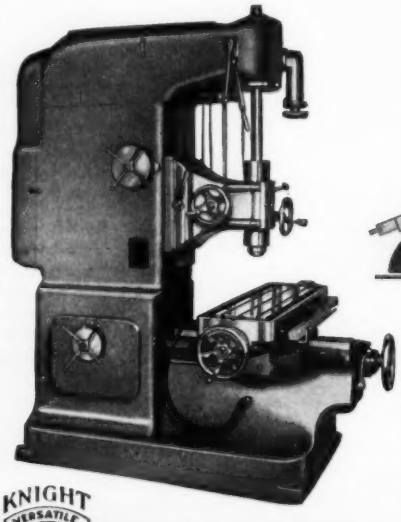
Here are machines noted for their speed, accuracy, versatility, simplicity and ease of operation —single precision-engineered units that can do the work of two or more special purpose machines but which demand a far lower initial investment —machines which have won such an outstanding

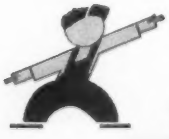


Smaller machines of this type, No. 30 and No. 20, are also shown in the Knight Catalog

No. 40
MILLING & PRECISION BORING MACHINE

A fast, versatile, powerful universal machine for both large and small jobs. Its tilting, swiveling table makes the use of expensive special jigs, angle plates or other fixtures unnecessary. 16 Table and spindle feed changes plus 4 vertical spindle feeds offer the most efficient use of small and large tools and cutters. One-piece column, wide bearing surfaces and precision gearing promise the most in accurate, effortless operation. Easy-to-reach controls for table direction, speeds and feeds — quick cutter changes at spindle nose — direct-reading speed and feed change dials — are only a few of the features that provide more efficient precision milling and boring.





No. 50
PRECISION BORING & VERTICAL MILLING MACHINE

A single solid base, fast, accurate machine of large capacity. Eliminates extra setup time and unnecessary work transfers. Exceptional cross and longitudinal table travel, large throat capacity plus long spindle travel provide a working range far greater than other machines of comparable size. Solid bed type construction for fast, heavy cutting — convenient controls — a complete range of feed and speed changes — all offer every opportunity to lower costs and raise profits.

KNIGHT — VERSATILE · ACCURATE · RIGID — MILLERS

MORE GOODS for MORE PEOPLE

Lower Costs & Higher Output!

UNUSUAL OPPORTUNITIES!

Money, Plus Improved Quality

reputation for performance during 40 years of service that 66⅔% of all orders for Knight Equipment come from present users!

Knight Equipment can help you — to conserve labor — eliminate lost motion — lower unit costs — raise production. Write today for information!

20"
ROTARY TABLE
for Rotary Milling & Indexing

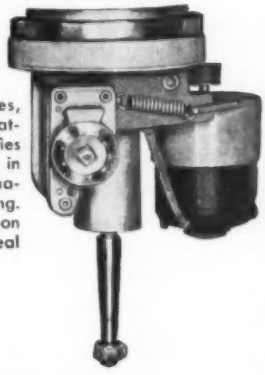
A self-contained motor-driven unit for use on any milling machine or horizontal boring mill. Eliminates all setup time. Operates off nearest electric outlet. No other equipment or connections required. Special geared-down motor provides ample power for almost any milling job. Eighteen quick feed changes from 1½" to 54" or 3" to 108" per minute. Automatic positioning and feed cycle are optional. May also be used wherever an automatic revolving fixture would save time and labor.

ELECTROMILL

A heavy duty vertical milling, drilling and boring machine for handling a wide range of large capacity work. Design permits elimination or inclusion of many features, speeds and feeds to meet any special requirement. Extra heavy table and saddle travel on rollers for easy operation. Deep throat provides exceptional capacity — long spindle bearings assure extra accuracy. Gearless smoother drive — complete machine controlled from a single panel that can be positioned for most convenient operation — safety features to protect work and operator — plus other fine engineered features offer a real investment in cost-cutting.

HOLE GRINDING ATTACHMENT

Accurately and quickly enlarges, straightens and finishes holes in heat-treated and hardened parts. Simplifies grinding work too large to swing in standard machines. Grinds holes in material too tough for smooth boring. Special adaptors permit installation on any milling or boring machine. A real time and labor saver.



W. B. KNIGHT
MACHINERY COMPANY

3920 WEST PINE BLVD. ST. LOUIS 8, MISSOURI

at LOWER COST

Mail This Coupon
FOR MORE INFORMATION

Attach to company letterhead

W. B. Knight Machinery Co.
3920 West Pine Blvd.,
St. Louis 8, Missouri.

Send complete details and prices on the following Knight Equipment:

_____

Name_____

Title_____

Van Keuren ... HEADQUARTERS FOR The Proof OF PRECISION

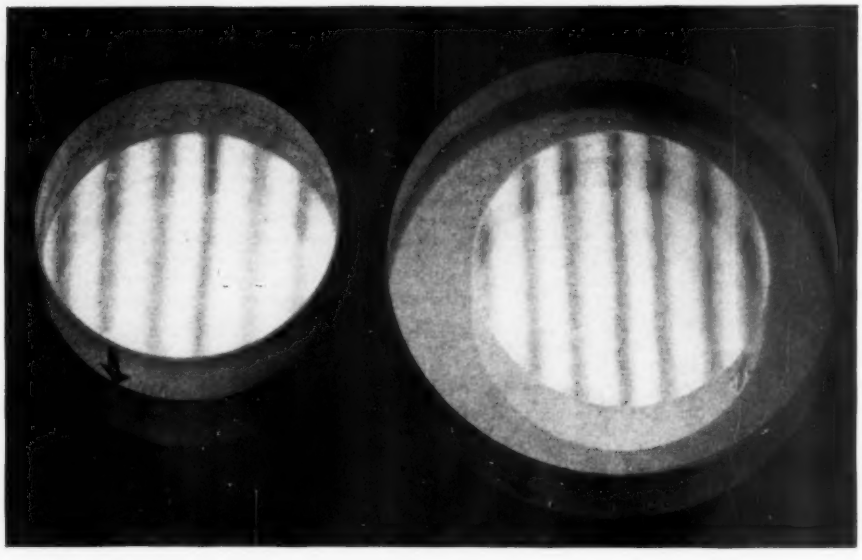


ILLUSTRATION SHOWS THE 4 FUSED QUARTZ OPTICAL FLATS FROM A VAN KEUREN LIGHT WAVE EQUIPMENT BEING TESTED AGAINST EACH OTHER.

STRAIGHT AND UNIFORMLY SPACED BANDS SHOW THAT ALL FLATS ARE ACCURATE TO ONE MILLIONTH OF AN INCH (.000001").

THE Van Keuren CO.

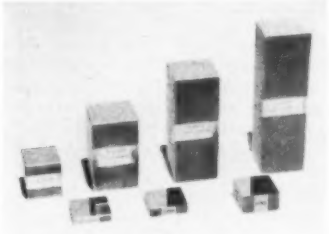
32nd YEAR

PRECISION MEASUREMENTS

THREAD AND GEAR MEASURING WIRES

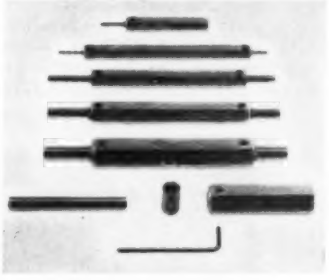
Van Keuren Measuring Wires are the accepted standard equipment for making pitch diameter measurements of taps, thread gages, precision threaded parts, worms, splines and gears. Our Gear Measuring System is generally accepted as the easiest and most accurate method of checking tooth thickness of gears of any standard pressure angle, 30° involute splines, and 90° involute serrations. Send for catalog No. 34. We invite you to send your gear problems to our engineering department.

SOLID SQUARE MASTER GAGE BLOCKS



The 30-Year Gage Blocks. These blocks, introduced in 1943, are the ultimate in design, workmanship, accuracy and durability. Each block approaches the perfection of the best optical flat or parallel, and is an ideal reference standard. Blocks up to 1.000" are 1" square, and the 2.000", 3.000" and 4.000" are 1¼" square. These blocks are made of steel so hard and dense that they can be successfully lapped only with the diamond. A set of Solid Square Master Blocks is good for 30 years of accuracy.

WIRE TYPE PLUG GAGES



Wire Type Plug Gages were originated by The Van Keuren Company in 1925. Units are 1⅞" and 2" long—an extra dividend to the customer—and are of uniform high hardness, exceptional finish, long wearing quality, and superlative accuracy. Available in all tolerances in tool steel, chromium plate, and tungsten carbide. On your next order specify Van Keuren Wire Type Plug Gages.

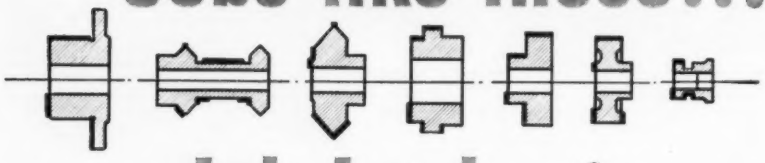
CATALOG AND HANDBOOK No. 34

Catalog and Handbook No. 34. This 208 page volume represents 32 years of experience and 2 years of research sponsored by The Van Keuren Company. It presents for the first time in history a simple and exact method of measuring screws and worms with wires. Tells how to measure gears, splines, and involute serrations. An accepted reference book for measuring problems and methods. *Copies free upon request.*

Light Wave Equipment • Light Wave Micrometers • Gage Blocks • Taper Insert Plug Gages • Wire Type Plug Gages • Measuring Wires • Thread Measuring Wires • Gear Measuring System • Shop Triangles • Carboloy Plug Gages • Carboloy Measuring Wires

173 WALTHAM STREET WATERTOWN, MASS.

Jobs like these...



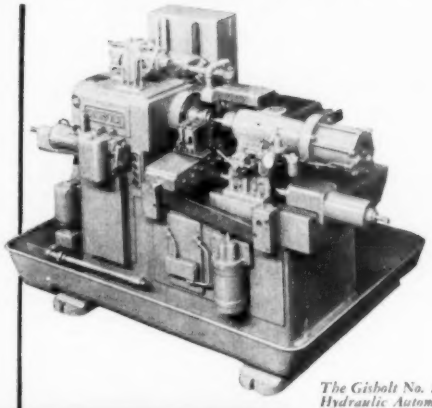
on a Job-Lot basis...

on Automatic Lathes?

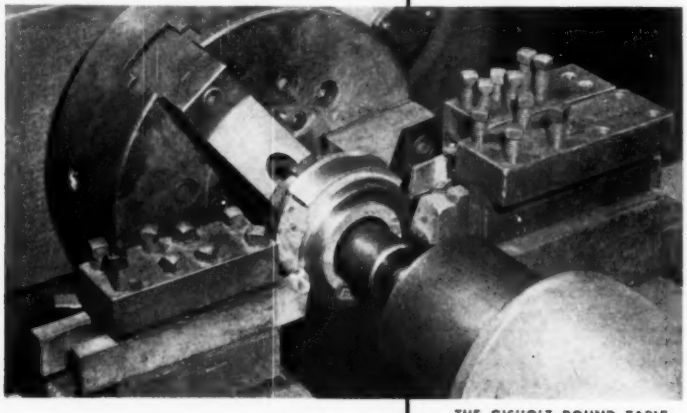
Absolutely! And these are only 8 of over 200 actual small-lot jobs handled on Gisholt No. 12 Hydraulic Automatic Lathes. The Crompton and Knowles Loom Works of Worcester, Mass., has *four* No. 12 Hydraulics busy producing and saving on work like this . . . and all with standard tool blocks!

Job-lot work like this—and like yours—is a natural for the No. 12 Automatic. The cost is no more than a hand-operated lathe for work this size . . . yet you have the added advantages of automatic machining and one-man operation of two or more machines.

If you have contract work like this, now or pending, it will pay you well to get the facts on the No. 12 Hydraulic Automatic Lathe. There's a big 24-page catalog free for the asking.



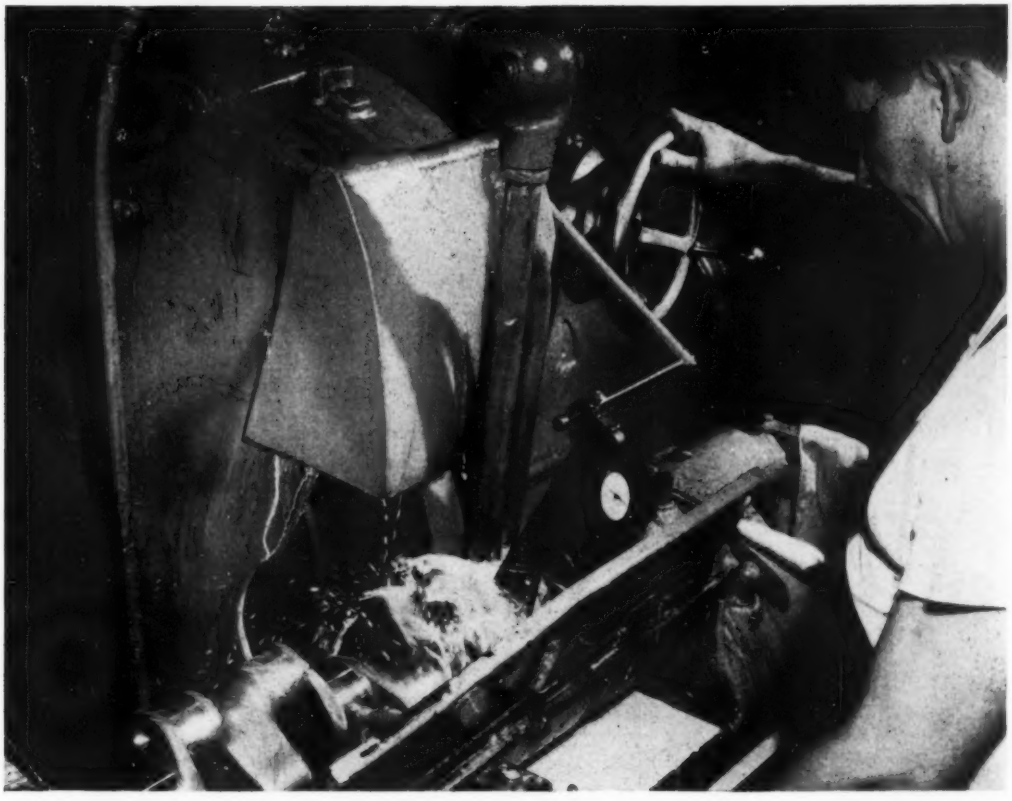
The Gisholt No. 12 Hydraulic Automatic Lathe gives you speed and accuracy plus *easy set-up.*



THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES



If a belt could do it better...

Grinding a crankshaft calls for a grinding wheel of definite specifications. But, if it could be done better, faster or more economically...with an abrasive belt, for instance... CARBORUNDUM would be free to recommend the *right* belt impartially. This is because only CARBORUNDUM manufactures a *complete* line of abrasives —and only CARBORUNDUM can make impartial recommendation of the *right* abrasive to use in every grinding or cutting operation.

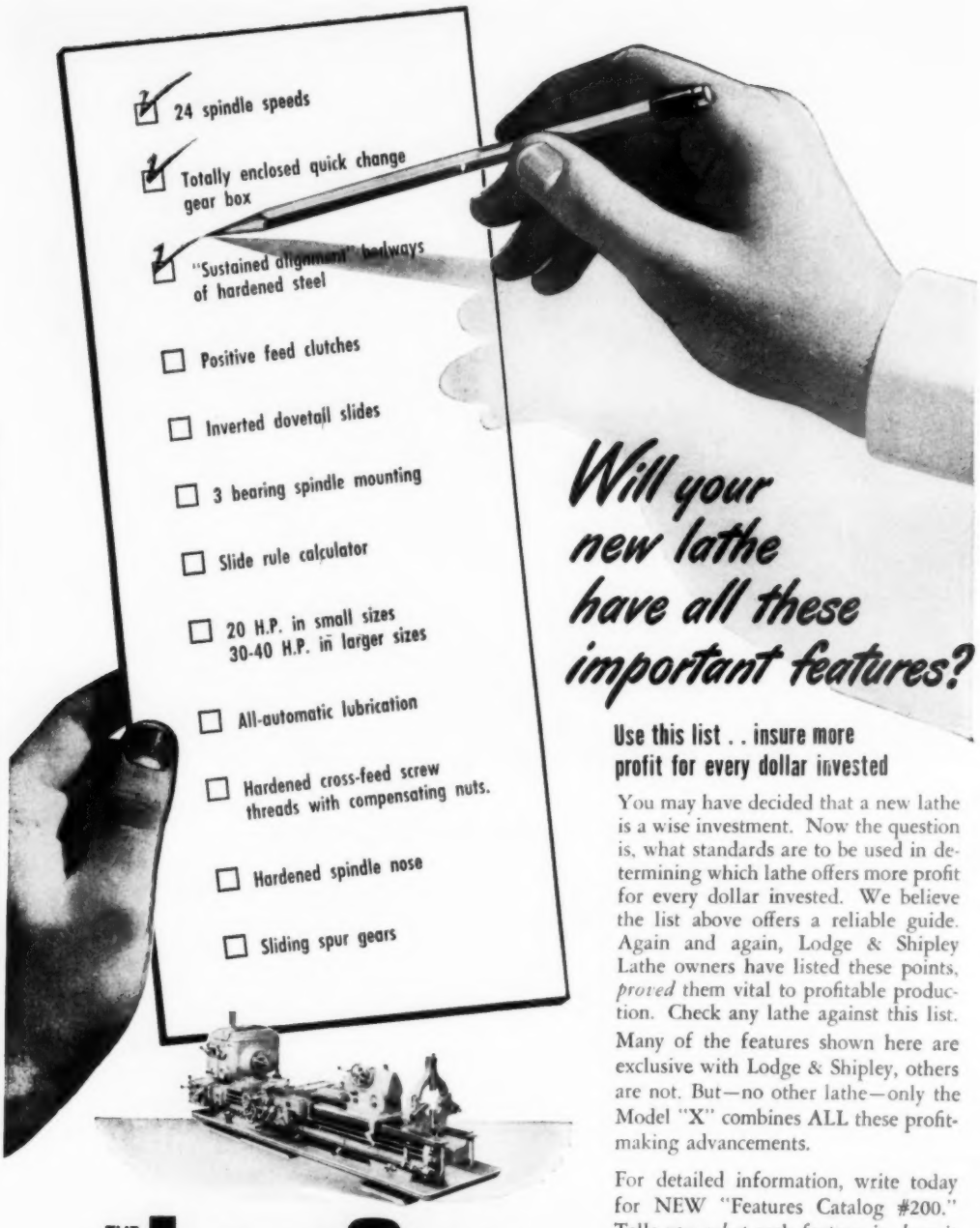
By standardizing on abrasives by CARBORUNDUM you get the benefit of technical advice on abrasive product use and latest developments in abrasives, without regard to production "limitations" in the abrasive field.

Only CARBORUNDUM

TRADE MARK

makes ALL abrasives to give you the proper ONE

"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company, Niagara Falls, N. Y.


24 spindle speeds
Totally enclosed quick change gear box
"Sustained alignment" bedways of hardened steel
Positive feed clutches
Inverted dovetail slides
3 bearing spindle mounting
Slide rule calculator
20 H.P. in small sizes
30-40 H.P. in larger sizes
All-automatic lubrication
Hardened cross-feed screw threads with compensating nuts.
Hardened spindle nose
Sliding spur gears

Will your new lathe have all these important features?

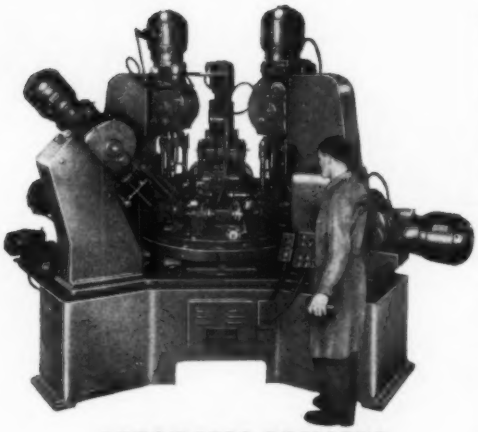
Use this list . . insure more profit for every dollar invested

You may have decided that a new lathe is a wise investment. Now the question is, what standards are to be used in determining which lathe offers more profit for every dollar invested. We believe the list above offers a reliable guide. Again and again, Lodge & Shipley Lathe owners have listed these points, *proved* them vital to profitable production. Check any lathe against this list. Many of the features shown here are exclusive with Lodge & Shipley, others are not. But—no other lathe—only the Model "X" combines ALL these profit-making advancements.

For detailed information, write today for NEW "Features Catalog #200." Tells you *what* each feature is, *how* it improves or speeds operation and *why* it's important to you. Write, also, for a supply of Check Lists to make your lathe comparisons.

THE **Lodge & Shipley** COMPANY

MACHINE TOOL DIVISION • 3055 COLERAIN
CHOREMASTER DIVISION • 800 EVANS ST.
CINCINNATI 25, OHIO



AUTOMATIC DRILLING & TAPPING MACHINES

Hartford Special Drilling and Tapping machines are designed and built to give maximum production and economy. These self-contained machines keep time and waste motion to a minimum, yet are compact and simple to operate. Bulletin DM-100 gives specific examples of machines which have boosted production.

AUTOMATIC THREAD ROLLERS

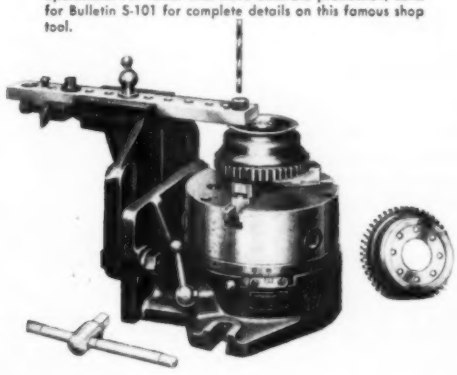
These high production machines will roll machine screws, wood screws, screwnails, drive screws and many others as well as specials. Screws from .086" to .190" with thread length capacity from ⅛" to 1½" are consistently rolled to Class 3 Thread Fit. Bulletin TR-100 gives complete details on design, construction and other features.

HARTFORD *Special*

...the best buy in the long run

"SUPER-SPACERS"

Hartford Special's time-tested "Super-Spacer" is the most versatile indexing fixture available for milling, drilling, grinding, boring, slotting, planing and numerous other operations. For faster and more accurate production, send for Bulletin S-101 for complete details on this famous shop tool.

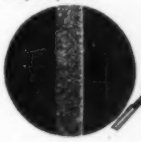


DIE POLISHING MACHINES

The Hartford Special Die Polisher utilizes an endless abrasive belt driven at grinding wheel speed which polishes the die parallel with the line of draw of work through the die. This method imparts a finer finish to the work, reduces upkeep and increases die life.

revolutionary

NEW DIAMOND BELT



This new Hartford Special development is a solid endless nylon belt in standard widths of ⅛, 3/16 and ¼" in 75 inch length, and 3/16, 5/16 and ¼" in 104 inch lengths. Diamond abrasive grades range from 1-5 micron size to 100 sieve size. All belts are color coded for abrasive grade identification. Bulletin PM-100 gives complete details.

THE HARTFORD SPECIAL MACHINERY CO. HARTFORD 12, CONN.

Fixed broaches + automatic cycle } = HIGH PRODUCTION

by broaching the *American* way

PROBLEM To broach six external lugs on a stamped transmission clutch flange part in one pass.
(The previous broaching set-up consisted of three fixed broaches on the machine slide, a receding table and an indexing type fixture. Three lugs were broached in one pass, the table receded, the fixture indexed 180° and the opposite three lugs broached. This did not meet production requirements nor accuracy as the receding table and index fixture allowed too great an accumulation of error.)

SOLUTION A special American 10 ton, 42 inch stroke vertical broaching machine arranged to push the part past six stationary roughing broaches in one pot which nibble and adjustable finishing broaches in the second pot which shave the part. A 3 to 4 times hourly production increase with the part held within the tolerance was the results of this ENGINEERED PRODUCTION broaching operation by American.

OPERATING CYCLE: The operator first loads a part and starts the automatic machine cycle with dual push buttons. The transfer slide moves forward to broaching position and automatically starts the main ram down. Fastened to the ram is a push bar which locates the part and pushes it through the stationary broaches. The part is automatically discharged at the end of the stroke. The automatic transfer slide returns to loading position allowing the operator to reload while the push bar is returning up.

American can give you this Greater Production Economy

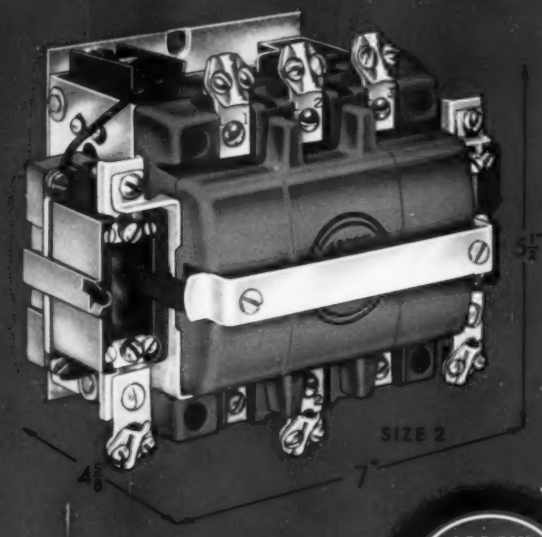
This is only one example of how broaching the American-way solved this manufacturer's problems. Because American manufactures a complete line of broaches, broaching machines and fixtures, they can help you engineer your job *completely* to obtain the greatest production economy. Start American working for you by sending a part print or sample and your hourly requirements.

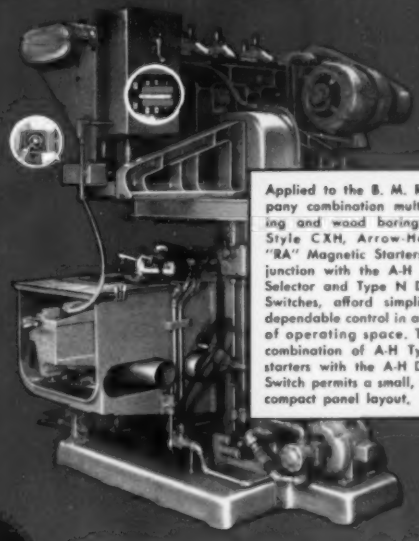
Write for Circular 300 showing American's complete line of hydraulic surface broaching machines.

American BROACH & MACHINE CO.
A DIVISION OF SUNDSTRAND MACHINE TOOL CO.
ANN ARBOR, MICHIGAN

See *American* First — for the Best in Broaching Tools, Broaching Machines, Special Machinery

BRING OUT **BUILT-IN PERFORMANCE** OF MOTORS AND MACHINERY





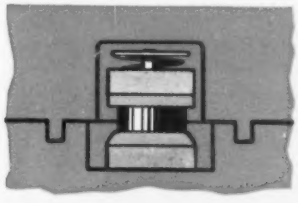
Applied to the B. M. Root Company combination multiple sawing and wood boring machine Style CXH, Arrow-Hart Type "RA" Magnetic Starters, in conjunction with the A-H Push-Pull Selector and Type N Disconnect Switches, afford simplified and dependable control in a minimum of operating space. The same combination of A-H Type "RA" starters with the A-H Disconnect Switch permits a small, unusually compact panel layout.

NEW TYPE "RA" ARROW AH HART MAGNETIC STARTERS

JUST 1/2 THE SPACE *PLUS* FULL PROTECTION

HIGH ARC RESISTANCE

Arrow-Hart "RA" Magnetic Starters and Contactors feature a new thermosetting molding compound in the base and hood. This alkyd, with an extremely high resistance to tracking, exceeds the arc resistance of the next best material by more than 50%. It does not support combustion. The tongue and groove design pictured at right provides individual arcing chambers around each contact. This full protection is only one of the many features that add up to outstanding performance in Arrow-Hart "RA" Magnetic Starters. For more of the story, see next page.



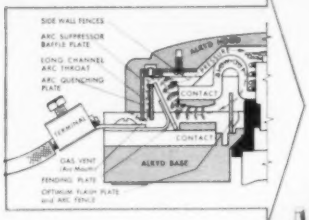
AVAILABLE IN A FULL LINE -- Sizes 0, 1, 2, 3, and 4.

THE ARROW-HART & HEGEMAN ELECTRIC COMPANY, HARTFORD, CONN., U. S. A.

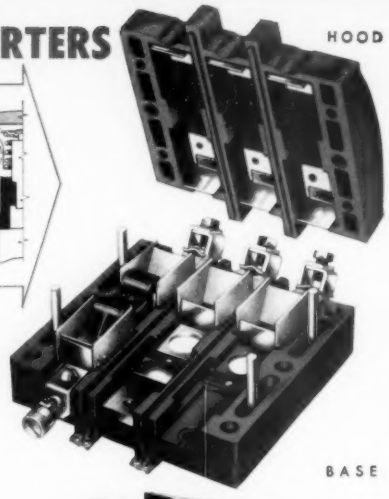
ARROW AH HART

TYPE "RA" MAGNETIC STARTERS

MAXIMUM SAFETY

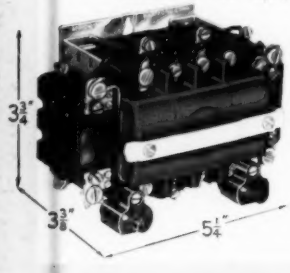


All A-H Magnetic Starters and Contactors are designed for maximum safety. The view at right shows how special protection is provided for the Size 4 (50 to 100 H.P.). This unit is designed so that the arc follows a controlled path, across and between the quenching and baffle plates. High heat-proof chutes enclose each contact. Contacts are shaped to produce a magnetic "blow-out" field within the arc fence. This field forces the arc in the correct direction for extinction.



MORE FEATURES--IN ½ THE SPACE

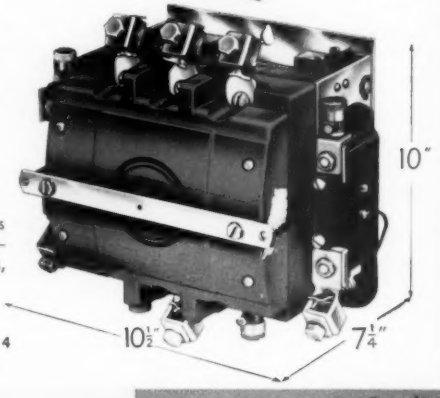
In A-H starters and contactors an exclusive new "RA" balanced mechanism multiplies leverage and increases contact pressure. It is this same mechanism that accounts for the revolutionary small size of Arrow-Hart starters. Other features are: guided parallel closures to insure contact alignment; new, bigger contacts; improved magnet and coil; plenty of wiring room; and many others. Most important of all — designers save valuable control equipment cavities, reduce control equipment cavities, and cut material costs.



SIZE 0

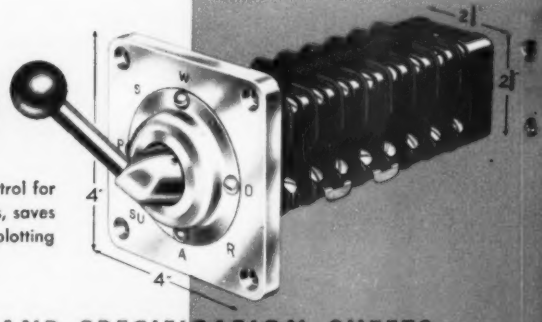
A STARTER FOR EVERY REQUIREMENT

Arrow-Hart Type "RA" Magnetic Starters and Contactors are available in a full line — Sizes 0, 1, 2, 3, and 4. For full particulars, write for Form G-7005.



SIZE 4

New PUSH-PULL SELECTOR SWITCH



The new Arrow-Hart PPS Switch provides a single point of control for multiple-operation machines — eliminates gangs of push buttons, saves time, money, and space. Target sheets available to aid in plotting your requirements.

WRITE TODAY FOR LITERATURE AND SPECIFICATION SHEETS

ARROW·HART

THE ARROW-HART & HEGEMAN ELECTRIC COMPANY
103 HAWTHORN STREET
HARTFORD 6, CONNECTICUT, U. S. A.

BRANCHES IN: BOSTON, CHICAGO, CLEVELAND, CINCINNATI, DALLAS, DENVER, DETROIT, LOS ANGELES, NEW YORK, PHILADELPHIA, SAN FRANCISCO, SYRACUSE. IN CANADA: ARROW-HART & HEGEMAN (CANADA) LTD., MT. DENNIS, TORONTO

PRINTED IN U. S. A.

MODERN PRECISION TOOLS

MODERN COLLAPSIBLE TAPS

Modern Self-Opening Die Heads are available in both stationary and rotary types. The stationary type is made in a range of sizes with capacity for cutting straight threads from ⅛" to 7", and ⅛" to 6" for pipe threads. Rotary type, straight threads from ⅛" to 1¼", pipe threads from ⅛" to ¾".

MODERN SELF-OPENING DIE HEADS

Of unusually simple design with a minimum number of parts and no complicated mechanisms, this new Modern Collapsible Tap Style A-A helps meet industry's demand for faster, lower cost production. It is made in a wide range of sizes with adequate capacities for cutting straight threads and straight and taper pipe threads. All parts are of properly hardened steel, ground and precision fitted.

Modern-Magic Quick Change Chuck and Collet Equipment virtually eliminates costly idle time usually present in revolving spindle operations. Tools are changed without stopping or even slowing the spindles. Modern-Magic Chucks are made in 6 sizes and two types: friction drive and positive drive. Modern-Magic Collets are available in a broad range of both standard and special types.

MODERN-MAGIC CHUCKS AND COLLET EQUIPMENT

Modern Self-Opening Stud Setters are positive and entirely automatic in action, and can be operated in any position with either air or electrically driven portable tools. Also equally effective in drill presses where it is possible to drill and tap the holes and set the studs in successive operations. Made in two sizes ½" and ⅞" capacity.

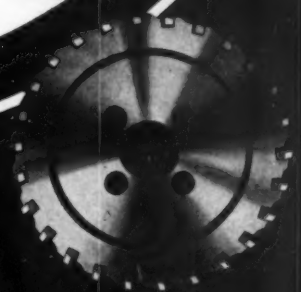
Modern Medium Duty Face Milling Cutters are of blade backed design, and are made in axial and radial types. Standard Modern axial type cutters are available in diameters from 4" to 24". Standard radial type cutters from 8" to 24" diameters. All blades, wedges and screws are interchangeable in all Modern Cutters regardless of diameters.

Detailed information covering any Modern Precision Tool in which you are interested will be furnished promptly upon request. Let us show you how Modern Precision Tools can help to speed up your production and reduce your costs.

Modern Precision Tools Include . . . . .

- STATIONARY SELF-OPENING DIE HEADS
- ROTARY SELF-OPENING DIE HEADS
- STATIONARY COLLAPSIBLE TAPS
- ROTARY COLLAPSIBLE TAPS
- MODERN-MAGIC CHUCKS AND COLLETS
- SELF-OPENING STUD SETTERS
- INSERTED BLADE FACE MILLING CUTTERS
- SOLID ADJUSTABLE DIE HEADS
- ADJUSTABLE HOLLOW MILLING TOOLS
- UNIVERSAL CHASER GRINDING FIXTURES

MODERN SELF-OPENING STUD SETTERS



MODERN FACE MILLING CUTTERS

Modern Precision Tools are produced by the originators of the Modern-Magic Quick Change Chuck and Collet Equipment.

MODERN TOOL WORKS

DIVISION OF

CONSOLIDATED MACHINE TOOL CORPORATION

ROCHESTER 10, NEW YORK

The PLUG GAGE of TODAY

DuBo* with High Visibility

COLOR FLASH —Handles

Already recognized as the leading bore checking gage of the fixed limit type, STANDARD DuBo Gage NOW brings you even more positive color identification of the "go" and "not go" members. Single end gages, sizes 1.510" to 6.010", are now furnished with solid red or green plastic handles. Double end gages, sizes .240" to 1.510", have large red and green bands on a handle redesigned for even greater speed and efficiency in use. No fumbling, no confusion, with these new DuBo Gages.

Double end DuBo Gage for small size bores

*U.S. and Foreign Patents Granted

And of course . . . all of DuBo's other advantages:

DEFINITE CHECK: No borderline cases with DuBo. Whether or not handle drops freely below center is definite yes-or-no answer.

LIGHTNESS IN WEIGHT: As much as 70% to 80% lighter than a cylindrical plug gage of equivalent size.

SELF-PILOTING: Utter ease of entering is a real and definite time-saver. Relieves nervous strain of fussy positioning.

LONG WEAR-LIFE: Outlast ordinary cylindrical plug gages many times and maintain accuracy throughout exceptionally long life.

It all means effective gaging WITH economy.

STANDARD GAGE CO., Inc., Poughkeepsie, N.Y.

"no more GAMBLING on tool steel selection"

[⅓ actual size; Selector is in 3 colors]

Since the first announcement, hundreds of tool steel users have received their CRUCIBLE TOOL STEEL SELECTORS. The comments received indicate that this handy method of *picking the right tool steel right from the start* is going over big.

"Handiest selector I've ever seen"

"No more gambling on tool steel selection"

"You're right, the application should dictate the choice of the tool steel" . . . and many, many more favorable comments.

You'll want your CRUCIBLE TOOL STEEL SELECTOR. It uses the only logical method of tool steel selection—begin with the application to pick the right steel! And the answer you get with one turn of the Selector dial will prove satisfactory in every case, for the CRUCIBLE TOOL STEEL SELECTOR covers 22 tool steels which fit 98% of all Tool Steel applications. ALL the tool steels on the Selector are in Warehouse Stock . . . that means when you get the answer, you can get the steel . . . fast!

Write for your Selector today! We want you to have it, because we know you've never seen anything that approaches your tool steel problems so simply and logically. Just fill out the coupon and mail. Act now! CRUCIBLE STEEL COMPANY OF AMERICA, Chrysler Building, New York 17, N. Y.

Here's how it works:

To use the Selector, all you need know is the characteristics that come with the job: type and condition of material to be worked, the number of pieces to be produced, the method of working, and the condition of the equipment to be used.

FOUR STEPS—and you've got the right answer!

1. Move arrow to major class covering application
2. Select sub-group which best fits application
3. Note major tool characteristics (under arrow) and other characteristics in cut-outs for each grade in sub-group
4. Select tool steel indicated

That's all there is to it!

Here's an example:

Application—Deep drawing die for steel

Major Class—Metal Forming—Cold

Sub-Group—Special Purpose

Tool Characteristics—Wear Resistance

Tool Steel—Airdi 150

One turn of the dial does it!

And you're sure you're right!!

Crucible Steel Company of America
Dept. A, Chrysler Building
New York 17, N. Y.

Gentlemen:

Sure! I want my CRUCIBLE TOOL STEEL SELECTOR!

Name_____ **Title**_____

Company_____

Street_____

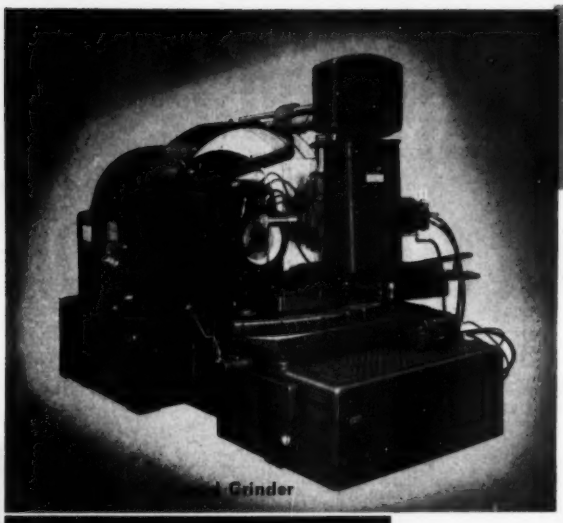
City_____ **State**_____

CRUCIBLE first name in special purpose steels

TOOL STEELS

fifty years of Fine *steelmaking*

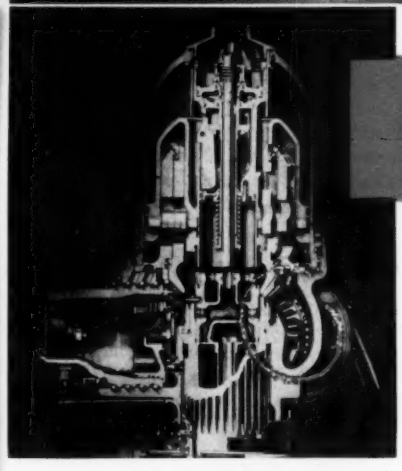
Branch Offices and Warehouses: ATLANTA • BALTIMORE • BOSTON • BUFFALO • CHARLOTTE • CHICAGO • CINCINNATI • CLEVELAND • DENVER • DETROIT HOUSTON, TEXAS • INDIANAPOLIS • LOS ANGELES • MILWAUKEE • NEWARK • NEW HAVEN • NEW YORK • PHILADELPHIA • PITTSBURGH • PROVIDENCE ROCKFORD • SAN FRANCISCO • SEATTLE • SPRINGFIELD, MASS. • ST. LOUIS • SYRACUSE • TORONTO, ONT. • WASHINGTON, D. C.



Grinder

ACCURATE, CURVED

In present day aircraft, the demand for bevel gears to meet special requirements has greatly increased. In power operated control drives for retractable landing gear, bomb bay doors, rudders, ailerons, variable pitch propellors, aircraft engines and transmissions and rotors for helicopters; Zerol bevel and spiral bevel gears, ground on a Gleason Spiral Bevel and Hypoid Grinder, have proven through actual service that the smooth fillet radius obtained permits longer operation under heavier loads. Increased accuracy, made possible through grinding, to remove hardening distortion has permitted operation at speeds greater than previously considered practicable.

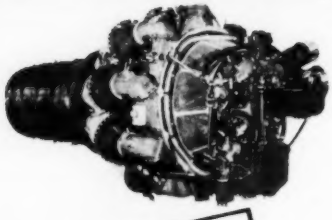


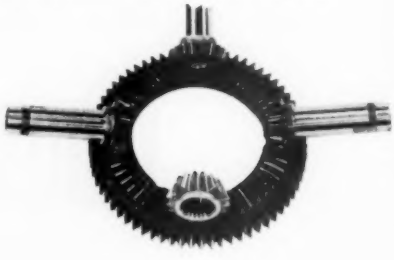
In the three-blade variable pitch propeller, the teeth of the blade segmental gears and rotating cam are of zerol bevel design, thus providing smooth, accurate operation.

Grinding gears on the Gleason No. 27 Hypoid Grinder assures through automatic grinding:

1. Highest precision and true interchangeability at mass production rates. Gears will be uniform for tooth size, tooth bearing and surface finish for the automatic cycle eliminates the variable human element.
2. An elimination of major causes of spoilage, operator's errors and omissions.

   With automatic cycle control, the operator cannot fail to follow the prescribed grinding sequence for every gear.
3. Ease of operation to simplify grinding of gears at production rates. Once machine is set up, operator has only to change work and push the start button.





GLEASON Works
1000 University Avenue
Rochester 3, N.Y., U.S.A.

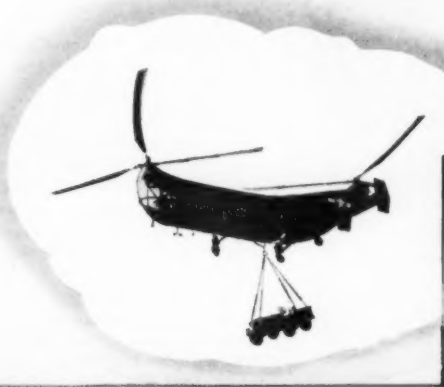
BUILDERS OF BEVEL GEAR MACHINERY

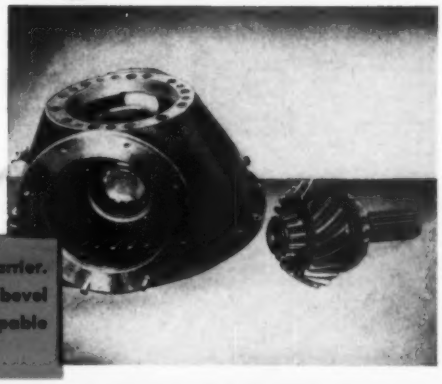
DURABLE GROUND TOOTH GEARS *for* AIRCRAFT

Close-up showing work, grinding wheel and diamond dressers.

In the helicopter field ground spiral bevel gears are used in 90° and 45° tail rotor drives and in the transmission between the motor and the elevating rotor. These ground gears are depended upon for both speed and power and greatly contribute to the successful specialized service helicopters perform for aviation.

In the helicopter shown at the right, which just set a new speed record for this type of aircraft, spiral bevel gears contribute to its success because the gears are ground to high precision.





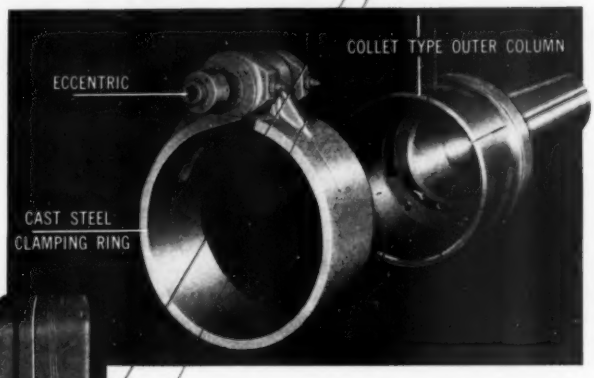
The helicopter to the right is used in many fields as a cargo carrier. Demonstration of its load carrying capacity proves the spiral bevel gears used in the transmission of power to the rotors are capable of great strength.

FOR OVER EIGHTY-FIVE YEARS...

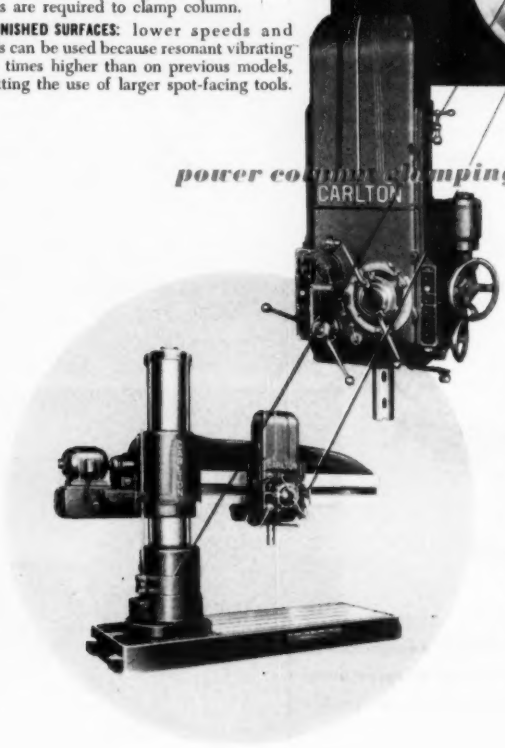
new! Carlton column clamping* device

better 6 ways!

1. **GREATER ACCURACY:** spindle displacement or movement when clamping column reduced to a maximum of .001".
2. **20% MORE RIGIDITY:** in the machine due to new column clamping device.
3. **INCREASED WORK CAPACITY:** full 360° clamping on large area between inner and outer column.
4. **FASTER OPERATION:** less time required to locate tool accurately in layout or jig work.
5. **LESS OPERATOR FATIGUE:** with push button control, few motions are required to clamp column.
6. **BETTER FINISHED SURFACES:** lower speeds and lighter feeds can be used because resonant vibrating point is 1½ times higher than on previous models, thus permitting the use of larger spot-facing tools.



power column clamping controlled by push button



Carlton's new Column-Clamp* . . . the most significant advance in the technique of column clamping in years . . . can now be revealed. We are announcing it today – at a time when our backlog of orders is the largest since World War II–because we think this development is so important that every radial buyer should be acquainted with it.

The Carlton Column-Clamp* has been thoroughly tested in the field. Wherever it has been used, it has been enthusiastically acclaimed as superior to all other radial column clamping devices past or present.

An additional accurate power clamp is provided for clamping the head tightly to the arm. Both the head and column may be clamped by power from the same push buttons, or each power clamp can be operated independently.

** Patent pending.*

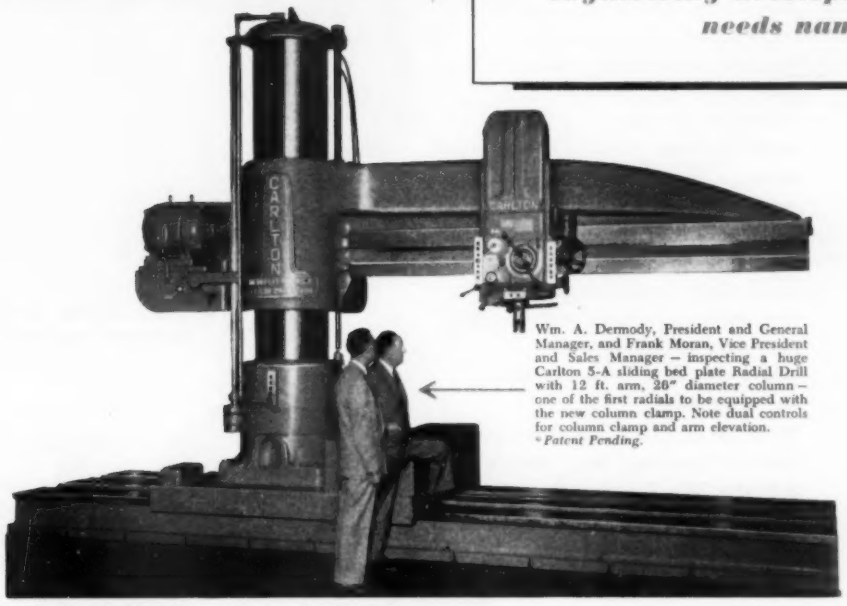
THE CARLTON MACHINE TOOL CO.
CINCINNATI 25, OHIO

announcing!

$1,000

Carlton column clamp* name contest

. . . latest Carlton engineering development needs name!



Wm. A. Dermody, President and General Manager, and Frank Moran, Vice President and Sales Manager — inspecting a huge Carlton 5-A sliding bed plate Radial Drill with 12 ft. arm, 26" diameter column — one of the first radials to be equipped with the new column clamp. Note dual controls for column clamp and arm elevation.
* *Patent Pending.*

The Carlton Column Clamp,* revolutionary new development contributing to more rigidity and greater accuracy in radial drilling—described on the opposite page—needs a name but quick. You can have yourself a lot of fun—and at the same time help us—by entering this novel contest. And if you submit *the winning name, you'll be $500 richer!* Furthermore, your Carlton distributor salesman will be awarded a $100 bonus—so count on him for lots of help.

Even though you don't win the grand prize of $500 cash, you may qualify for one of the many valuable honorable mention merchandise prizes which are worth $500 in the aggregate.

Contest Rules are Simple . . . send for them today. Fill in the coupon below and you'll also receive your official entry blank and the Power Clamping bulletin that tells you all about Carlton's sensational new column clamp.

Don't delay . . . contest closes midnight, March 31, 1951.
Fill in and mail coupon today!

Contest Committee
THE CARLTON MACHINE TOOL CO., CINCINNATI 25, OHIO

Gentlemen: I'll think up a good name for your new Column Clamp.* Send me immediately (1) contest rules and official entry blank and (2) Power Clamping Bulletin describing the column clamp.

NAME _____

COMPANY _____ TITLE _____

CITY _____ STATE _____

5 steps of progressive design!

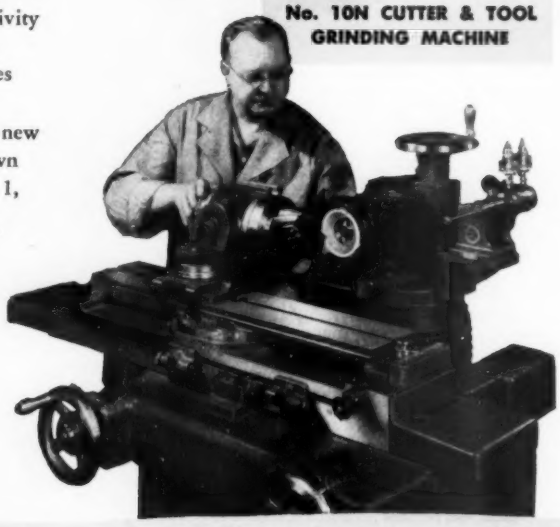
During 1950, Brown & Sharpe has announced the 5 new developments in machine tools and equipment shown here. This is typical of the major contributions which this company is constantly making to faster, lower-cost, more-accurate production for metal working plants.

When you specify machine tools and equipment backed by such progressive engineering design, you are taking the soundest way to insure bigger returns on your investment . . . higher productivity for operators and machines . . . longer *accurate* life for machines and equipment.

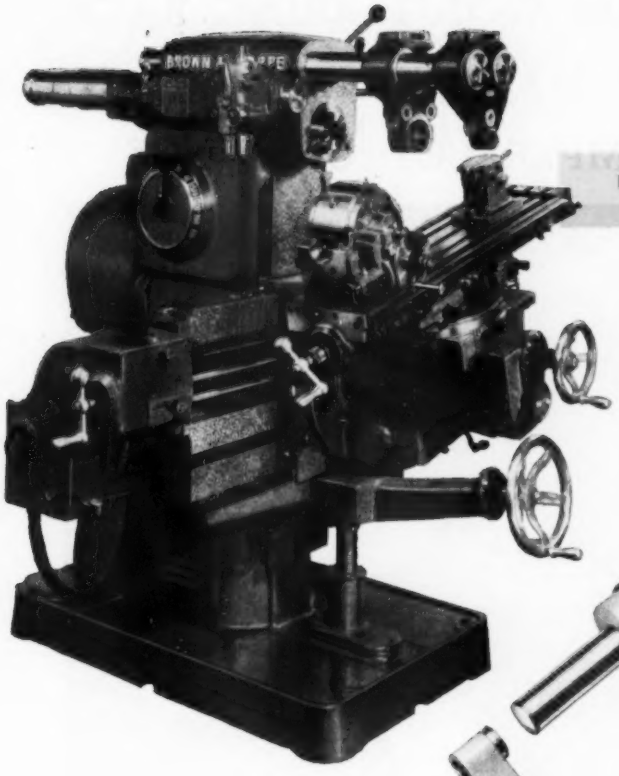
Write for details on any of the new products illustrated here. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

AUTOMATIC REVERSING VANE PUMPS

No. 10N CUTTER & TOOL GRINDING MACHINE



Brown & Sharpe



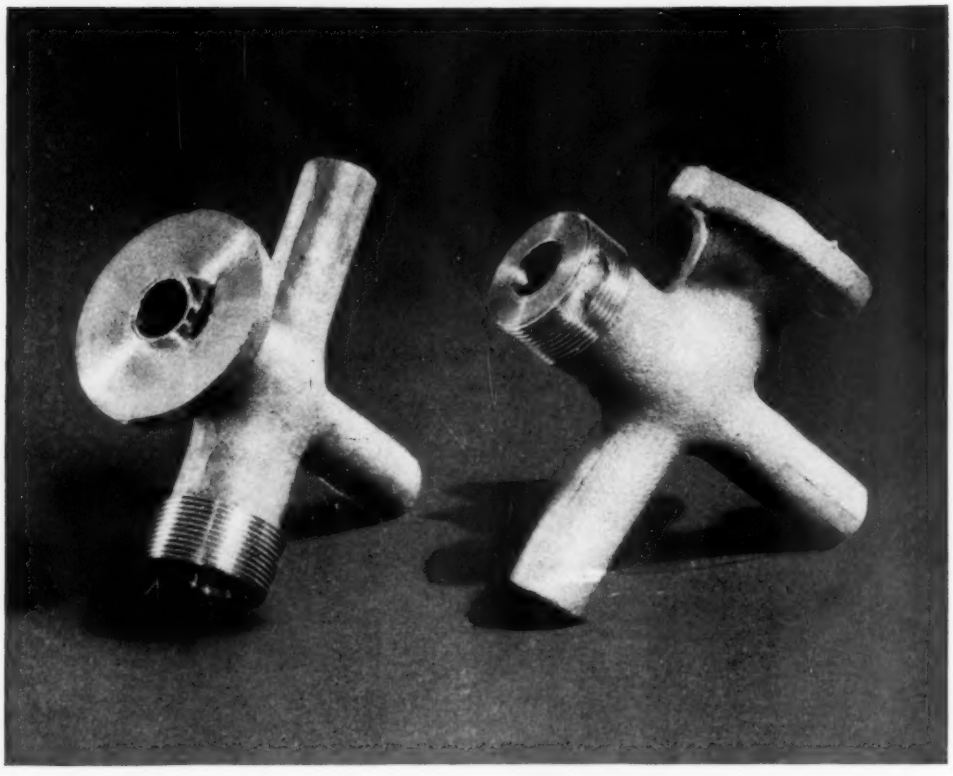
NO. 0 OMNIVERSAL
MILLING MACHINE

COMPLETELY NEW LINE
OF MICROMETERS

OIL OR WATER HARDENING
GROUND FLAT STOCK

B·S

AN ALIBI WON'T BRING BACK MONEY WASTED MACHINING IMPERFECT CASTINGS!



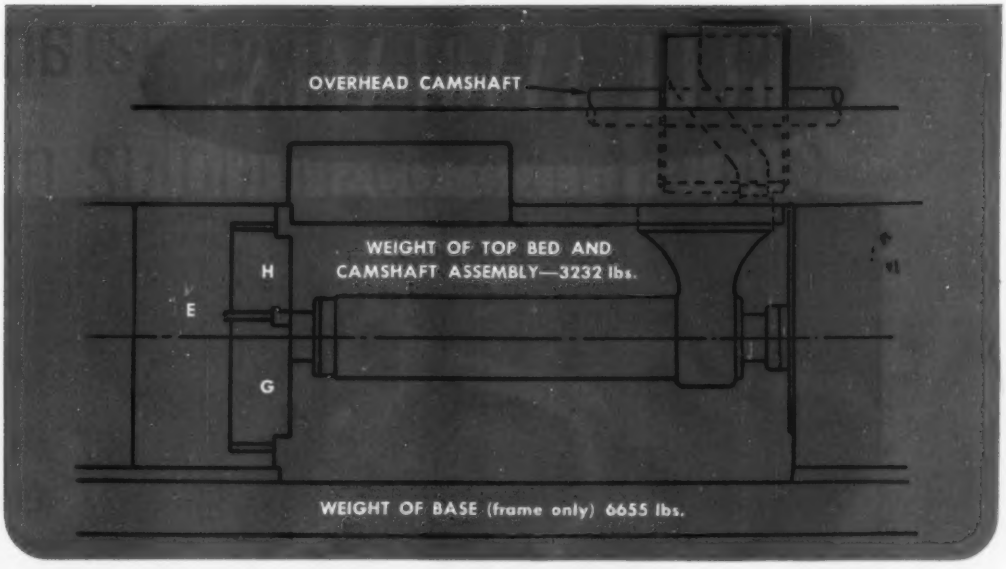
So put your confidence in radiography . . . one of management's surest instruments for cutting cost!

AN outstanding example of the contribution of radiography to production processes is revealed by an automobile manufacturer. By pointing the way to improved foundry techniques — radiography is credited with saving this company in excess of a quarter million dollars a year in one part alone.

Another story of savings and profit made possible through the magic of radiography. A double-edge tool that not only diagnoses accurately and authoritatively — but suggests treatment as well.

Radiography shows where savings can be made, designs improved, new techniques developed. Write for interesting, informative booklet, "Radiography as a Foundry Tool." General Electric X-Ray Corporation, Dept. AB-1, Milwaukee 14, Wisconsin.

GENERAL ELECTRIC
X-RAY CORPORATION



PROFITS BEGIN WITH GOOD BUYING

Machine selection is often the difference between profit and loss, and the choice of one brand over another can be a vital decision. A machine that is not put to its best use is theoretically idle. A poor selection takes toll of all brands of the same type through greater sales resistance and cost. The information prepared for better machine selection before the purchase should be as thorough and useful as that of the operation and maintenance hand books supplied after.

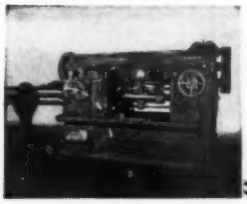
The information given above and below is useful in determining the facility of the 1½" Six Spindle CONOMATIC MAIN CROSS SLIDES:

1. **They have never been equalled for dependable, low cost operation and maintenance in the handling of wide, heavy, form cuts.**

The four, rectangular, box type, CROSS SLIDES, H and G, on front and rear sides of the machine, are nickel moly iron normalized. Their total weight is 296 lbs. They are held in axial position by retaining gibs against the finished wall surface of the machine frame support. They are held in parallel, radial position by their top and bottom flat bearing surfaces with tapered gib adjustment. The total area of their radial bearings, alone, is 444½ square inches.

2. **They have a higher maximum load recommendation than do the cross slides of other "automatics."**

The maximum load recommendation for each MAIN CROSS SLIDE is 3200 ft. lbs. The short (22" high) 11¾" by 44" Frame Support, E, weighs 802 lbs. net. It holds the slides between, and in close proximity to, nearly FIVE TONS of "bridged" construction.



Buyer's Comparison Chart will guide you to full information

A Comparison of ALL Automatics is in Favor of Cone

Conomatic CONE AUTOMATIC MACHINE COMPANY, INC. WINDSOR, VT., U.S.A.

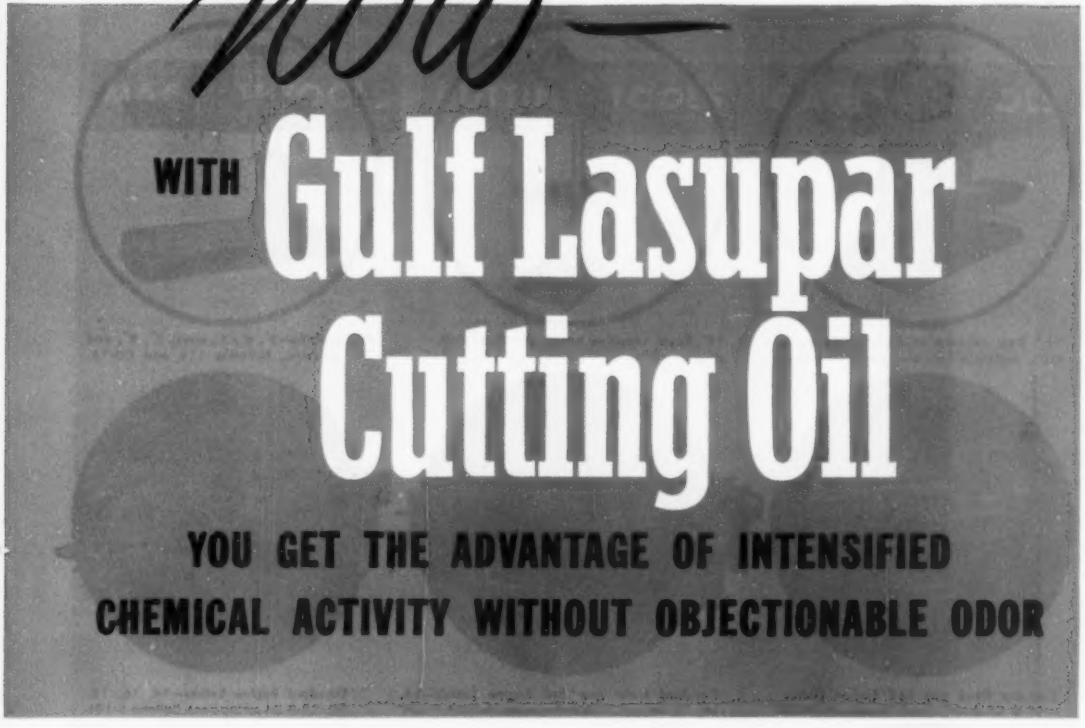
GULF ANNOUNCES: an

FIFTY YEARS OF SERVICE
1901 GULF 1951
PETROLEUM AND ITS PRODUCTS

outstanding improvement in sulphurized cutting oils

Now—

WITH Gulf Lasupar Cutting Oil



YOU GET THE ADVANTAGE OF INTENSIFIED CHEMICAL ACTIVITY WITHOUT OBJECTIONABLE ODOR

Already preferred by scores of shops because of its excellent performance characteristics, Gulf Lasupar Cutting Oil has been even further improved. Thanks to a special Gulf process, it now provides even greater sulphur activity over the entire range of a cutting operation.

This intensified chemical action permits increased feeds and speeds on tough machining jobs and provides excellent protection for the tool—helps reduce built-up edge, prevents chip welding. Result: remarkable production and tool-life records wherever it is used.

Gulf Lasupar Cutting Oil also contains a percentage of stable sulphurized fatty oil, effective in producing the fine finishes for which this quality cutting oil is so well known.

Operators everywhere will welcome the new Gulf Lasupar Cutting Oil—because they will get all these production advantages without the disagreeable odor ordinarily associated with sulphurized cutting oils.

Call in a Gulf Lubrication Engineer today and arrange to use Gulf Lasupar Cutting Oil on some of your tough machining jobs. Write, wire, or phone your nearest Gulf office or send the coupon below. Gulf Oil Corporation · Gulf Refining Company, Gulf Building, Pittsburgh, Pennsylvania.

Gulf Oil Corporation · Gulf Refining Company AM
3S-Z Gulf Building, Pittsburgh 30, Pa.

Please send me, without obligation, a copy of your new pamphlet "Gulf Lasupar Cutting Oil."

Name .....

Company .....

Title .....

Address .....

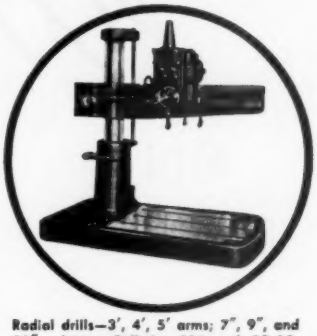
16" Royal sensitive bench and floor drill, single and multiple spindles. Bulletin 216.

21" Box column sliding head floor drill, single spindle. Bulletin 100A.

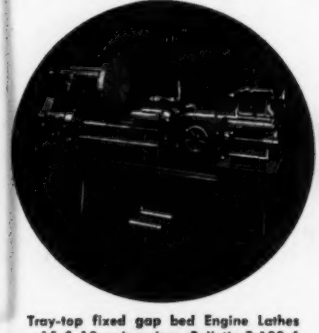
16" Box column sliding head bench and floor drill, single spindle. Bulletins 155V, 119, 215.

21" Box column sliding head floor drill, multiple spindle. Bulletin 100A.

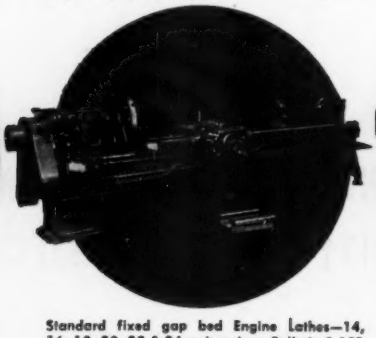
18" Royal sensitive bench and floor drill, single and multiple spindle. Bulletin 218.



Radial drills—3', 4', 5' arms; 7", 9", and 11" columns. Bulletins 116 and CO-15.



Tray-top fixed gap bed Engine Lathes —15 & 18 swing sizes. Bulletin T-100-4



Standard fixed gap bed Engine Lathes—14, 16, 18, 20, 22 & 24 swing sizes. Bulletin S-101

Standard Engine Lathes—14, 16, 18, 20, 22 & 24 swing sizes. Bulletin S-101

Tray-top Engine & Toolroom Lathes—10, 12½, 15 & 18 swing sizes. Bulletin T-100-4

plus value

High productivity, versatility, and money-saving features you normally find only on expensive drilling machines and engine lathes are standard equipment at no extra cost in the famous Cincinnati and Canedy-Otto lines. For example: Cincinnati Tray-Top all-geared head light duty engine lathes have 12 spindle speeds, 48 thread and feed changes, extra large spindles, totally enclosed quick change gear box, quickest and easiest changeover from English to metric thread chasing, and many other valuable features. All machines in these lines are backed by a leading name in machine tool manufacture: The Cincinnati Lathe & Tool Co., Cincinnati 9, Ohio.

cincinnati lathe & tool co.

WHATEVER YOUR METALWORKING NEEDS
FOR THE CRITICAL YEAR AHEAD...

Look to PRATT & WHITNEY

FOR ACCURACY • QUALITY • DEPENDABILITY

MACHINE TOOLS

- Jig Borers
- Vertical Precision Hole Grinders
- Precision Rotary Tables
- Vertical Shapers
- Toolroom Lathes
- Automatic Lathes
- Bench Lathes
- Bench Millers
- Thread Millers
- Vertical Millers and Profilers
- Die Sinkers
- Automatic Duplicating Machines
- Keller Machines
- Kellerflex Flexible Shaft Machines
- Cutter and Radius Grinders
- Contour Cutter Grinders
- Vertical Surface Grinders
- Die Grinders
- Gear Grinders
- Worm Grinders
- Automatic Centering Machines
- Horizontal Deep Hole Drillers
- Vertical Deep Hole Drillers
- Horizontal Deep Hole Reamers
- Deep Hole Drill Sharpener
- Diaform Wheel Forming Attachment

CUTTING TOOLS

- Hand and Machine Screw Taps
- Tapper Taps
- Pipe Taps
- Duacone Dies and Holders
- Adjustable Round Split Dies
- Thread Rolling Dies
- Precision Screw Plates
- Milling Cutters
- Metal Slitting Saws
- Thread Milling Cutters
- "Hi-Helix" End Mills
- Shell End Mills
- Form Cutters
- Die Sinking Cutters
- Profiling Cutters
- Keller Cutters and Tracers
- Hand Reamers
- Shell Reamers
- "Blue Helix" Chucking Reamers
- Stub Screw Machine Reamers
- Camlock Adjustable Reamers
- Punches, Dies & Couplings
- Drills
- Johnson's Cut-Off Blades
- T-Cut Blades
- Counterbores, Solid and Interchangeable
- Solid Carbide and Carbide Tipped Tools
- Kellerflex Carbide Burs and Di-Burs

GAGING TOOLS

- Cylindrical Plugs and Rings
- Carbide Cylindrical Plugs and Rings
- Reversible Cylindrical Plugs
- Master Setting Discs
- Thread Plugs and Rings
- Carbide Thread Plugs and Rings
- Reversible Thread Plugs
- Roll Thread Snaps
- Combination Tri-Rolls
- Pipe Thread Plugs
- Pipe Thread Rings
- Oil Country (API) Gages
- Adjustable Limit Snaps
- AAR Wheel and Coupler Gages
- Thread Measuring Wires
- Precision End Measures
- Hoke Precision Gage Blocks
- USA Precision Gage Blocks
- Carbide Hoke and USA Blocks
- Standard Measuring Machines
- Supermicrometer
- Lead Testers
- Universal Internal Comparators
- Electrolimit Comparators
- Air-O-Limit Comparators
- Tri-Roll Thread Comparator
- Continuous Mill Gages
- Syncro Timer
- Multiple Station Gages
- Special Gages

PRATT & WHITNEY
Division Niles-Bement-Pond Company
WEST HARTFORD 1, CONNECTICUT

"There's no better-paying Investment than the Right Tools for the Job"

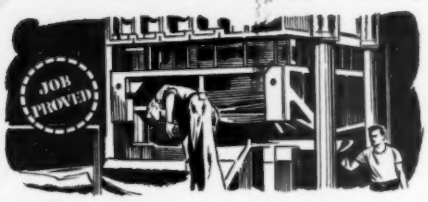
JOB PROVED

SUN PRODUCTS OFFER YOU "JOB PROVED" PERFORMANCE

Sun's wide selection of "Job Proved" petroleum products, plus the vast experience of Sun Engineers, can help you cut costs, step up production, and improve quality. Every Sun product, after its development in the laboratory, must pass rigid and exhaustive tests in actual use. When the worth of the product has been completely demonstrated in this way, then—and then only—it is given the "Job Proved" stamp and offered for sale. Detailed product information and the help of Sun Engineers are yours for the asking. Call your local Sun Office.

SUN OIL COMPANY
PHILADELPHIA 3, PA.
Sun Oil Company, Ltd., Toronto and Montreal

INDUSTRIAL OILS



Original charge of Sunvis as good as new after three years' use in hydraulic press.

SUNVIS 900 OILS—Unexcelled for turbine lubrication, for use as a hydraulic medium, for circulating systems and similar applications requiring longest possible oil life, plus maximum protection to equipment. Sunvis 900 Oils have a high viscosity index and uniform 0°F. pour point, and are fortified against corrosion and oxidation.

SUNVIS OILS—Give long, trouble-free service in all types of industrial reservoirs and circulating systems operating at normal temperatures. Sunvis Oils have uniform high viscosity index, low pour point, and low carbon content.

SUNVIS H.D. 700 OILS—For internal combustion engines operating under heavy-duty conditions, or where hydraulic valve-lifters are used; for circulating systems and other industrial applications where contamination is a factor. The additives in Sunvis H.D. 700 Oils supply detergency, and minimize oxidation and corrosion.

SUNVIS 800 OILS—Special heavy-duty lubricating oils used in railroad diesel engines equipped with silver-alloy bearings.

SUNVIS 2200 AND SUNVIS 2300—Heavy-Duty Supplement #1 and Supplement #2 quality oils respectively. For use in diesel engines where high-sulfur fuels may be encountered.

DYNAVIS OILS—For internal combustion engines operating at moderate loads and speeds. These low-pour-point, high-viscosity-index, inhibited oils help prevent formation of harmful corrosive and sludge-forming acids.

CIRCO OILS—Straight mineral oils for general lubrication of industrial machinery. Unsurpassed for once-through applications, regardless of operating temperatures.

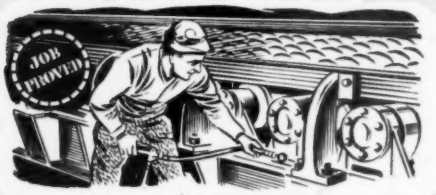
SUNTAC OILS—Recommended for general lubrication of all machines subjected to sudden shocks and load reversals. Compounded to increase adhesiveness, Suntac Oils cling to bearing surfaces and supply constant, superior lubrication.

STEAM CYLINDER OILS—Lubricants of high flash and fire point for saturated or superheated steam conditions and for worm gear speed-reduction units.

SUNOCO WAY LUBRICANT—Eliminates "stick-slip" of tables and scoring of ways. Noncorrosive, with outstanding metal-wetting and adhesive properties, ample viscosity and E.P. qualities. Approved by 36 leading machine tool manufacturers.

ROCK DRILL OIL—High-film-strength oil for use in jackhammers, stopers, drifters, and similar equipment.

INDUSTRIAL GREASES



Sun grease increases steel mill production by cutting bearing failures 92%.

SUN GUN GREASES—Smooth greases made with medium-viscosity oil. Stable under pressure in power and booster guns.

"JOB PROVED" IN EVERY INDUSTRY

SUN

SUN ADHESIVE PRESSURE GREASES—Won't drip or splash. Excellent lubricants for open-gear applications.

SUN DARK PRESSURE-SYSTEM GREASES—For power-driven central grease lubricating systems in heavy industries. Also used as "medium cup greases."

SUN MINE CAR GREASES—Available in several grades. Suitable for both antifriction bearings and plain-bearing cavity-type wheels.

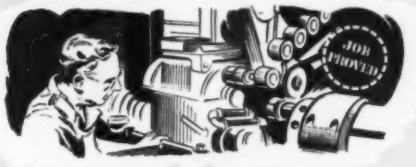
SUN MINING MACHINE LUBRICANT—Semifluid. For use where a light but adhesive grease is required. Resists separation and decomposition.

SUN ROLLER BEARING GREASES—For use on electric motors and generators and high-temperature machinery equipped with ball or roller bearings.

SUN GEAR COMPOUNDS—Black adhesive open-gear compounds and wire-cable greases. Recommended for power presses, mining machinery, worn reduction mills, crushers, pump gears, etc.

SUNOCO TRACTOR ROLLER COMPOUND—For crawler-type tractors. Provides good lubrication with exceptional sealing qualities.

METALWORKING OILS



Ball bearing manufacturer finds that Sunicut increases tool life 15%, eliminates sludging.

SUNICUT—Straight (non-emulsifiable) transparent cutting oils. Various grades for automatic screw machines and heavy-duty machining operations. Permit high speed production with excellent finishes, long tool life.

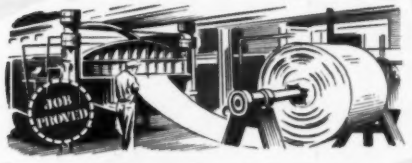
SUNOCO EMULSIFYING CUTTING OIL—An emulsifiable oil which produces a stable white emulsion. Efficient and economical cooling and lubricating medium for turning, milling, drilling, and other metalworking operations on both ferrous and nonferrous metals. It is also an excellent grinding coolant. Available in heavy-duty grades too.

SUN QUENCHING OILS—Specially refined oils designed to aid development of maximum physical properties in a wide variety of steels.

SUN TEMPERING OILS—Specially refined oils for tempering steel. Because of their low carbon content and stability under heat, these oils have an unusually long service life.

SUN ROLLING OILS—Straight and emulsifying oils which will permit maximum production in rolling steel, aluminum, brass, and copper.

RUBBER-PROCESS AIDS



Two Sun rubber-process aids save manufacturer $6,000 a year by taking the place of five competitive products.

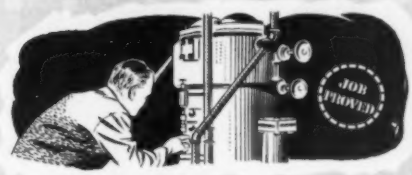
CIRCOSOL-2XH—An elasticator and process aid for natural rubber and especially for GR-S. Outstanding for sponge rubber.

CIRCO LIGHT PROCESS-AID—A processing agent and excellent softener for natural rubber, natural rubber reclaims, and neoprene synthetic rubber. Used for GR-S to some extent.

SUNDEX-53—An inexpensive product suitable for processing GR-S and blends of GR-S and natural rubber. An established process aid for rubber footwear stocks and semihard rubbers.

CIRCOMAR-5AA—A dark-colored product for processing natural and GR-S rubber used in tire-making. Also used in reclaiming natural-rubber scrap. Replaces asphalt fluxes. Free-flowing at room temperature.

REFRIGERATION OILS



Hotel turns to Sunisо for its ice-making equipment; eliminates separation troubles, cuts oil costs 20%.

SUNISO REFRIGERATION OILS—High-quality oils having extremely low pour points, extremely low wax-separating characteristics, a high degree of stability, and long life. Initially neutral and resistant to formation of detrimental acids. Suniso grades are available to meet all low, normal, and high temperature conditions. The most widely used oils in refrigerating and air-conditioning.

SUNOCO WAXES

Waxes, "tailor made" to provide the exact properties demanded by different industries, are now available from Sun's new multimillion-dollar wax plant. Revolutionary manufacturing methods make it possible to retain only the wax portions desired for a particular use, while discarding those which might be detrimental.

Sunoco Waxes are precision-controlled for quality and uniformity of *all* physical and chemical characteristics important to the user. The various grades of Sunoco Wax are recommended on the basis of their ability to give superior performance on the specific job.

TEXTILE OILS

Sunotex replaces three formula components in textile mill; also saves 25% on costs.

SUNOTEX TEXTILE-PROCESS AIDS—Designed to impart desired additional properties to various fibers during their processing from the raw state into a manufactured product. All Sunotex textile-process aids are emulsifiable in water. Highest rating in Fade-Ometer tests.

SUN COTTON CONDITIONERS—Processing materials which prevent waste by cutting down excessive amounts of fly (fine air-borne lint particles).

SUN ASBESTOS FIBER CONDITIONER—Sprayed on asbestos during processing to keep fibers from being damaged or broken down. Harmful dust is minimized when this product is used.

SUN CORDAGE OILS—Generally used alone, but adaptable to various formulas used by cordage manufacturers. Selected products, highly compatible with additives.

SUNOTEX MACHINE OIL—One lubricant for nearly every kind of textile machine. A high-quality mineral oil and additive combination which prevents rust, clings to moving parts, and minimizes wear. Scours out of *all kinds* of fabrics easily and completely.

ADDITIONAL INDUSTRIAL PRODUCTS

SUN SOLVENTS—Sun Spirits for the thinning of paints, varnishes, and enamels, for metal-cleaning, and certain types of processing and extraction . . . a pure, water-white petroleum solvent free of corrosive sulfur. Other Sun solvents with special properties are available for the chemical industry.

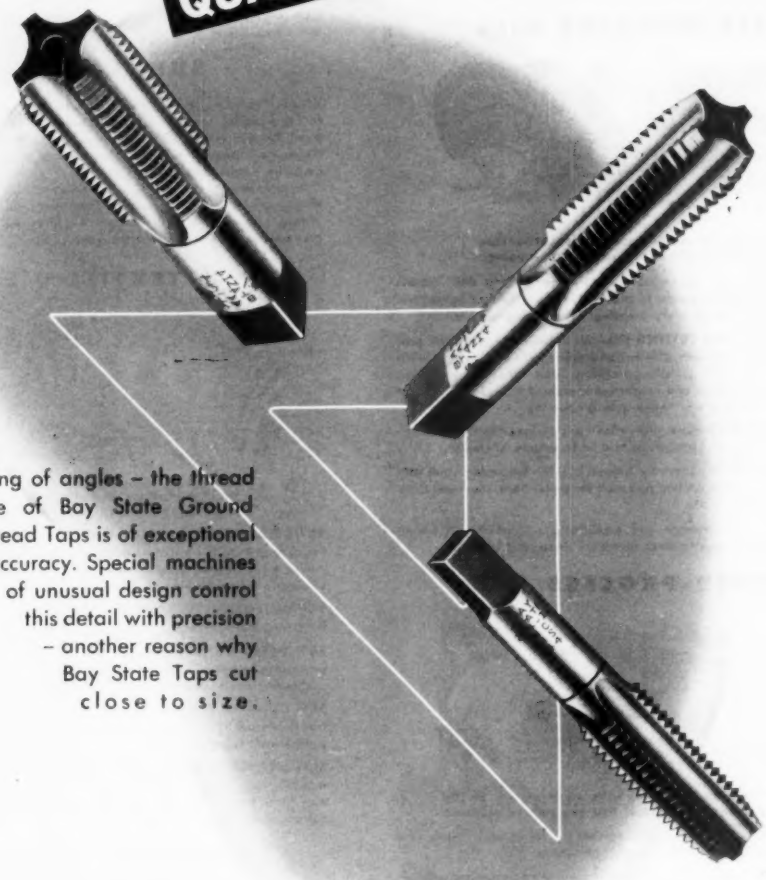
SUN LEATHER OILS—Petroleum-base leather oils. Used for obtaining the desired tensile strength, proper temper, and controlled moisture content. Maintain a light even color, mix well, and distribute evenly.

INDUSTRIAL PRODUCTS

SUNOCO®

BAY STATE

QUALITY FROM ANY ANGLE



Speaking of angles – the thread angle of Bay State Ground Thread Taps is of exceptional accuracy. Special machines of unusual design control this detail with precision – another reason why Bay State Taps cut close to size.

BAY STATE TAP & DIE CO.

MANSFIELD, MASS.

ON NEARBY SHELVES OF INDUSTRIAL SUPPLY DISTRIBUTORS

PERFECTION STOVE

reduces maintenance costs . . . gets rapid, thorough cleaning of parts and casings with VAPOR DEGREASING

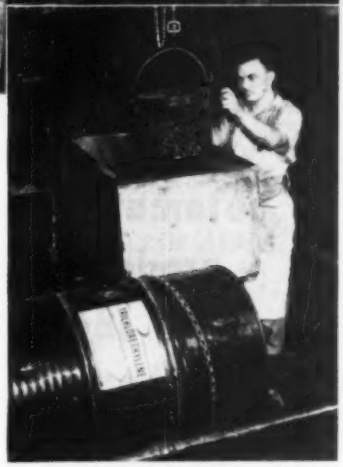
A fast, efficient cleaning method which fits in well with its conveyorized production system—that's how the Perfection Stove Co. of Cleveland describes Vapor Degreasing. The vapor degreasers, using trichlorethylene solvent, turn out thoroughly cleaned metal parts at an average rate of 3,000 pounds per hour . . . and with a minimum amount of equipment maintenance.

Perfection Stove's three vapor degreasing units remove machine oil and drawing compounds from portable heaters, kerosene range and cook stove parts, screws and other pieces. Vapor Degreasing leaves no spots . . . requires no afterwiping . . . provides an excellent surface for paint adhesion.

The Perfection Stove Co. is only one of many firms throughout the country which are today getting more production and lower costs with this modern cleaning method.

Trichlorethylene Degreasing Solvent

Under various trade marks, Du Pont degreasing solvents have been widely used for many years. These solvents are stable . . . the best yet developed by Du Pont for metal degreasing. They stand up against contaminating and destructive materials which may be introduced in degreasing . . . assist materially in carrying out efficient and economical metal cleaning.



Top picture: Large capacity degreaser handles heavy load of small parts. **Lower picture:** Worker cleaning screw machine parts in small degreasing unit.

SEND FOR FREE BOOKLETS

In this helpful literature, you will find detailed information on the advantages of vapor degreasing, the equipment used, the Du Pont degreasing solvents, and many industrial applications. Just clip the coupon below!

Tune in Du Pont "Cavalcade of America" Tuesday nights—NBC coast to coast

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DU PONT SOLVENTS for VAPOR DEGREASING

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Please send me your free literature covering the vapor degreasing process and solvents. We are interested in cleaning _____ products.

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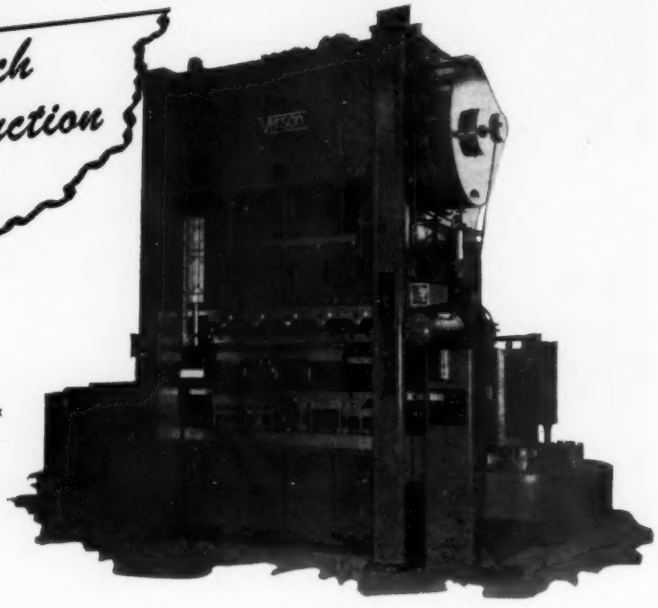
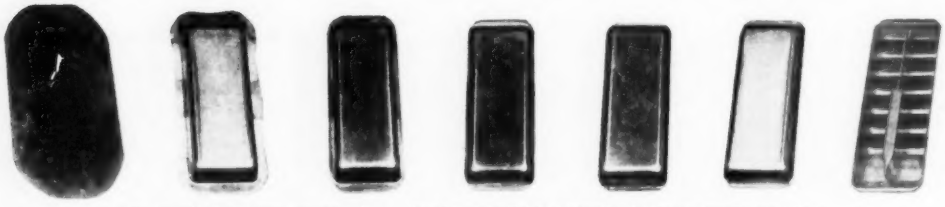
Can you match these production figures?



THIS TRADE Verson MARK TRANSMAT PRESS automatically produces over 1800 ice cube trays per hour!

If you mass produce press formed metal products, Verson TRANSMAT Presses and tooling offer a time-saving, cost-cutting and space-saving method of high speed, automatic metal forming. Utilizing coil stock or blanks (depending on scrap economy), TRANSMAT Presses automatically perform successive operations without intermediate handling, pickling or annealing. One press does the work of several in a fraction of the space at a fraction of the cost.

TRANSMAT forming is now adaptable to a wide variety of shapes that range from deep drawn automotive coil containers to intricate washing machine legs. We will be pleased to show you what TRANSMAT Presses have done for others and what they can do for you. Write for details.



An ice cube tray every two seconds . . . from blank to finished stamping in five automatic operations without intermediate handling. At right is the finished tray assembly. A single TRANSMAT Press with one operator increased production 350% and released three presses and five operators for other work.

Originators and Pioneers of Allsteel Stamping Press Construction

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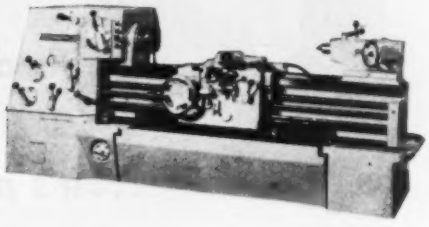
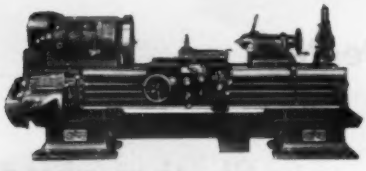
LATHES

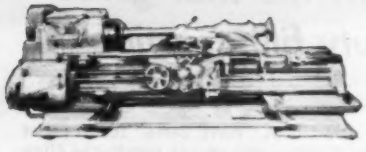
handle a wider range of work—

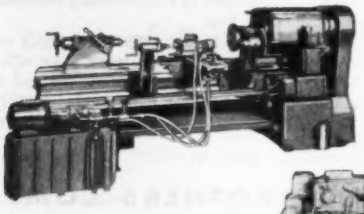
increase output—

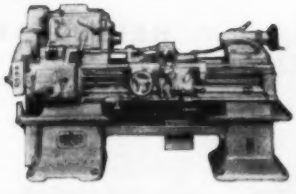
lower operating costs











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. . . it's different

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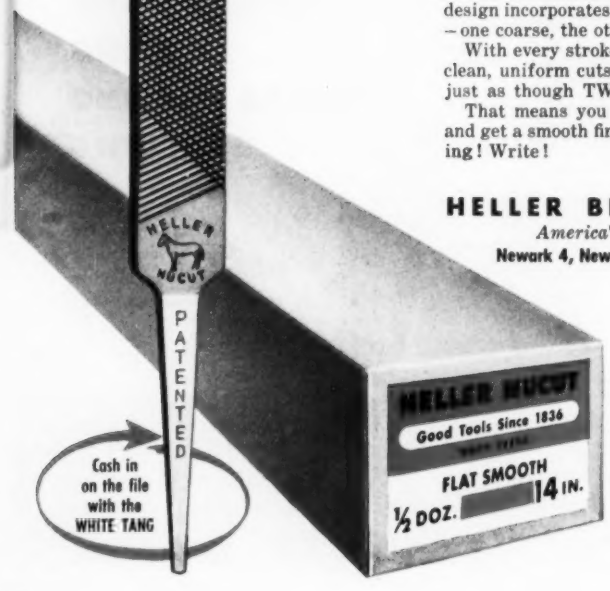

It's the patented Heller Nucut "Wavy Teeth" feature that makes the difference. This cut-and-smooth two-in-one filing design incorporates two sets of *scientifically* positioned teeth – one coarse, the other fine.

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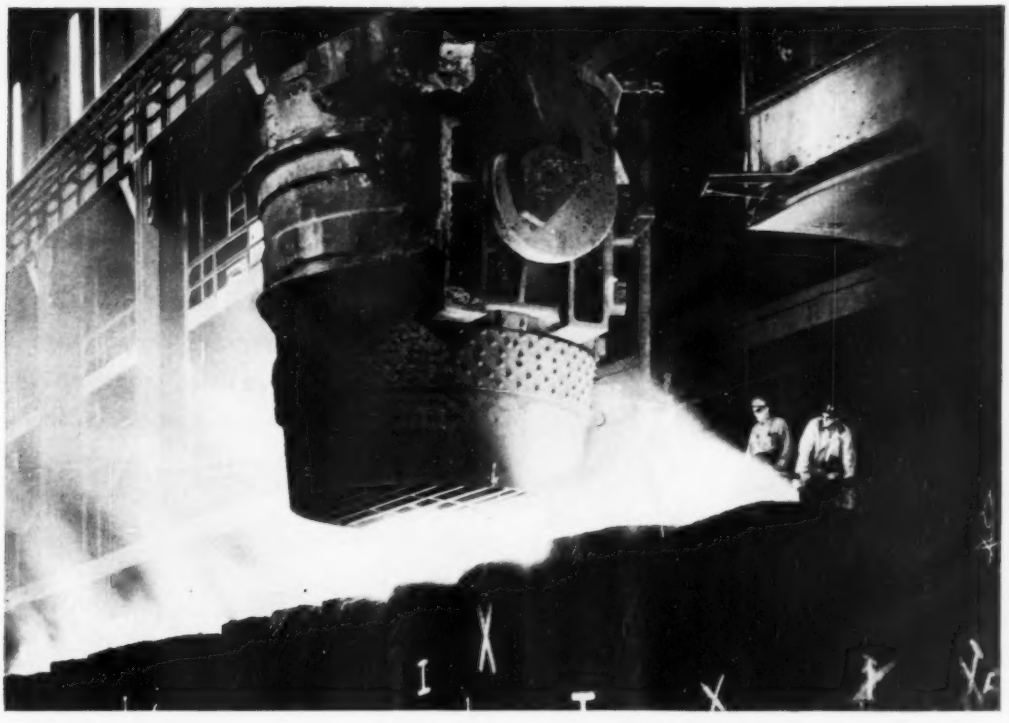


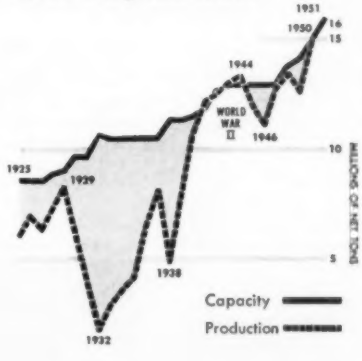
MILLION TONS MORE STEEL

Latest Increase in Bethlehem's Annual Capacity Climaxes 5 Years of Postwar 3,100,000-Ton Expansion

On January 1 of this year Bethlehem's steel making capacity stood at 16 million ingot-tons annually—*an increase of 1 million tons* over a year ago.

Since the war ended we have increased our annual steelmaking capacity *3,100,000 tons, or 24 per cent.*

Moreover, as the chart at the right shows, Bethlehem's steel capacity has nearly doubled in 25 years. Additional capacity can and will be created as it is needed.



BETHLEHEM STEEL ★ BETHLEHEM STEEL ★

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More than 600 exponents belonging to 12 European and American Nations, over 2.000 machine-tools in working order. The 1951 European Machine-Tool Exhibition will afford to eventual buyers of the whole world an eminently suitable opportunity to compare and to choose in the course of a stay in Paris at a particularly pleasant period of the year, the equipment which will suit best to their needs, among the widest range of machines ever shown before.

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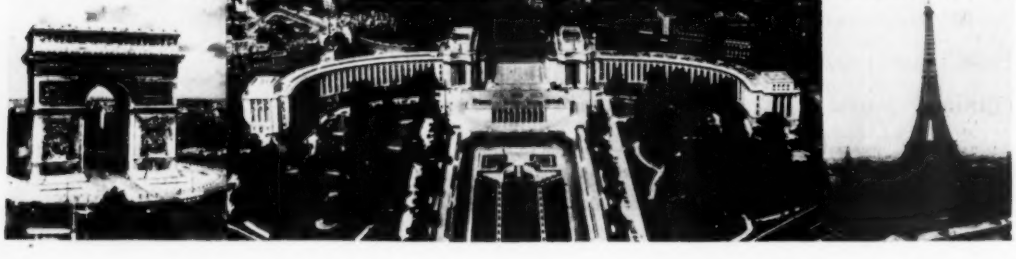


Your keenest competitor knows

That no matter how well established his business may be, ***nothing can damage it more than better equipment and better methods in the hands of an aggressive rival!***

He also knows that unless YOUR equipment and methods are "up-to-the-minute", YOU cannot continue to sell YOUR products at competitive prices.

Photos Courtesy of Caterpillar Tractor Co. Peoria 8, Ill.

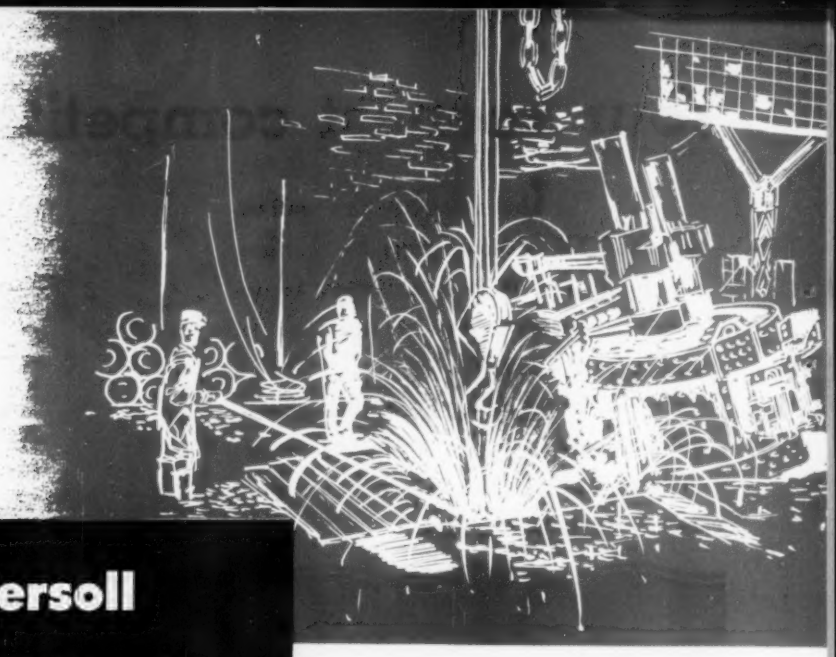
Caterpillar

Here's a big manufacturer, builder of big machines, who knows the competitive advantages of Jones & Lamson Turret Lathes! CATERPILLAR TRACTOR CO. —world famous producer of Diesel Engines, Tractors, Motor Graders and Earth-moving Equipment—makes sure of top-flight production economy by concentrating on up-to-the-minute machines and methods. Meeting production schedules on Caterpillar's turret lathe jobs, like the husky malleable iron Adjustable Bearing shown here, calls for the last word in turning equipment. To bore, turn, face and chamfer such parts, at peak efficiency, takes a fast, heavy-duty turret lathe with reserves of *Speed, Power, Rigidity and Repetitive Accuracy. It takes a J & L!*

Are YOU equipped to YOUR best advantage? Get a free check-up on your present operations. Write today to Jones & Lamson's PRODUCTION RESEARCH DEPARTMENT for this service.

Turret Lathes—Fay Automatic Lathes—Thread Grinders—Optical Comparators—Threading Dies

JONES & LAMSON
MACHINE COMPANY
Springfield, Vermont, U.S.A.



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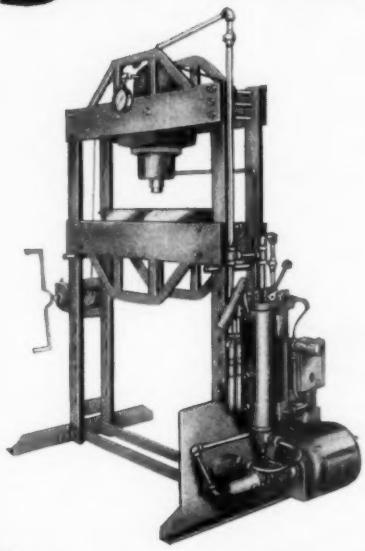
...and we can do it again!

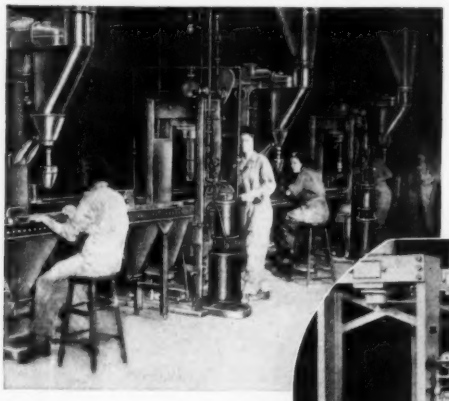
K. R. WILSON IS BACK ON AMERICA'S DEFENSE TEAM

NEW threats, new aggressions bring to mind the part KRW played in World War II. Navy ships equipped with machine shops had special 25 ton KRW Hydraulic Presses. Thousands of special air-oil operated ammunition loading presses were supplied to shell and bomb loading contractors. KRW presses speeded safe operations in the nation's largest arsenals. In fact, hundreds of industries helped to speed victory with KRW presses.

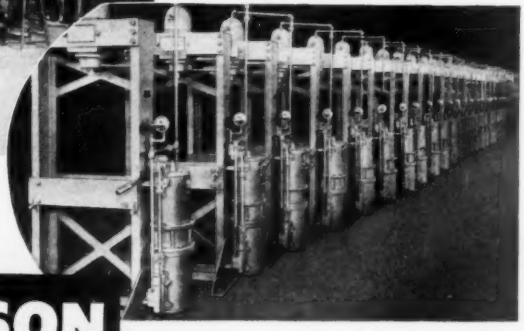
Now, unfortunately, America is threatened again. Here at KRW we're ready and determined to add our muscles to the nation's strength. All our facilities are at your disposal. If you need standard KRW presses, we'll get them to you right away. If you need specially-built presses, our engineering department will design them to your needs. Let us know! Write Dept. 11 for full information.



HERE'S the 37MD-1 KRW Hydraulic Press, ideally suited for trying out dies before sending them to production runs. KRW presses from 25-150 tons, hand operated, air operated or motor driven; one, two and three cylinder models; fast, flexible and self-contained above ground.



THOUSANDS of these special ammunition loading presses were used for safe shell loading during World War II. Let our engineers show you how KRW can speed production and cut costs for you.



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√ **Like *all* Lapointe Broaching Machines,** it is designed for great versatility, and can be adapted to many uses. It is *not* just a one-purpose machine, for it requires only new fixtures in order to broach an entirely different part from that for which it was originally purchased.

√ ***Maybe this is your answer*** to the problem of how to tool up for defense contracts without running the risk of having needless machines on hand when those contracts are completed.

√ **You will be impressed** with the many possibilities of Broaching by Lapointe. We suggest that you write, today, for our *condensed Catalog No. 2.*

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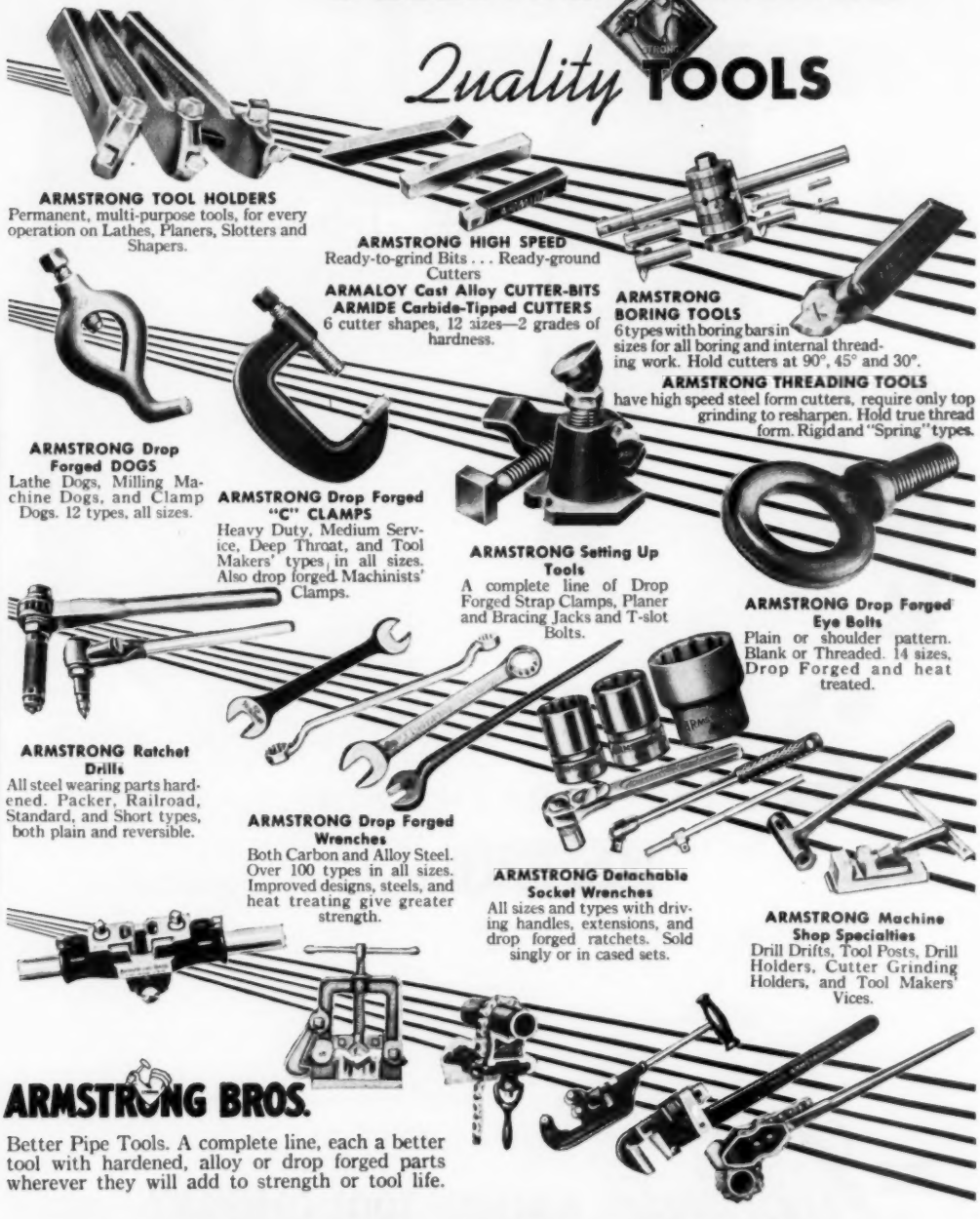
THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHES AND BROACHING MACHINES

ARMSTRONG

Quality TOOLS



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Permanent, multi-purpose tools, for every operation on Lathes, Planers, Slotters and Shapers.

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Ready-to-grind Bits . . . Ready-ground Cutters

ARMALOY Cast Alloy CUTTER-BITS
ARMIDE Carbide-Tipped CUTTERS
6 cutter shapes, 12 sizes—2 grades of hardness.

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6 types with boring bars in sizes for all boring and internal threading work. Hold cutters at 90°, 45° and 30°.

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have high speed steel form cutters, require only top grinding to resharpen. Hold true thread form. Rigid and "Spring" types.

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Lathe Dogs, Milling Machine Dogs, and Clamp Dogs. 12 types, all sizes.

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A complete line of Drop Forged Strap Clamps, Planer and Bracing Jacks and T-slot Bolts.

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Plain or shoulder pattern. Blank or Threaded. 14 sizes. Drop Forged and heat treated.

ARMSTRONG Ratchet Drills
All steel wearing parts hardened. Packer, Railroad, Standard, and Short types, both plain and reversible.

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Both Carbon and Alloy Steel. Over 100 types in all sizes. Improved designs, steels, and heat treating give greater strength.

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All sizes and types with driving handles, extensions, and drop forged ratchets. Sold singly or in cased sets.

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Drill Drifts, Tool Posts, Drill Holders, Cutter Grinding Holders, and Tool Makers' Vices.

ARMSTRONG BROS.

Better Pipe Tools. A complete line, each a better tool with hardened, alloy or drop forged parts wherever they will add to strength or tool life.

ARMSTRONG BROS. TOOL CO.

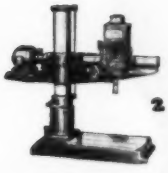
"The Tool Holder People"

5215 W. ARMSTRONG AVENUE **CHICAGO 30, ILL.**

Which SUPER SERVICE will suit your JOB?

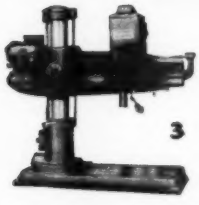
For greatest savings in drilling cost The Cincinnati Bickford Tool Company offers a complete line of 34 different sizes and types of drilling machines. One of these machines will cut your drilling costs more efficiently. Our engineers will help you select the proper machine for your work, or if you prefer, send for any or all of the bulletins pertaining to the machines that interest you.

1. The smallest SUPER SERVICE Radial Drill manufactured by The Cincinnati Bickford Tool Company, as described in Bulletin R-26A, has a 7½" diameter column and a 2½' arm length. This machine is furnished with 6 speeds and 3 feeds and a 1 HP driving motor.

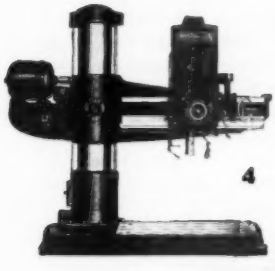


2. The 9" Diameter Column SUPER SERVICE Radial Drill, as described in Circular R-21B, is built in either a 3' or 4' arm length with 9 speeds and 4 feeds powered with a 3 HP driving motor.

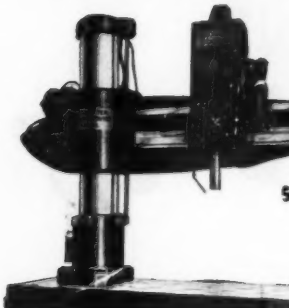
3. SUPER SERVICE Radial with 11" dia. column is described in Bulletin R-29. Built with a 3', 4' or 5' arm. 12 speeds and 6 feeds or 36 speeds and 18 feeds furnished. Powered with either a 5 or 7½ HP driving motor.



4. The 36-speed 18-feed SUPER SERVICE Radial Drill, as described in Booklet R-29, is furnished in 11 different standard sizes, ranging from 4' to 8' arm lengths and 13" to 19" diameter columns. These machines are furnished with 7½ to 20 HP driving motors.

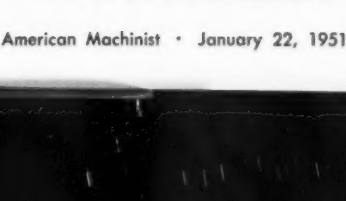


5. The SUPER SERVICE Master Radial Drill, as described in Circular R-22, is built in 7' to 12' arm lengths and in 22" and 26" diameter columns. This machine has 36 speeds and 18 feeds powered by motors from 20 to 40 HP.



6. The SUPER SERVICE Portable Horizontal Drilling Machine with 6 speeds and 1½ HP driving motor is more fully described in Bulletin HR.

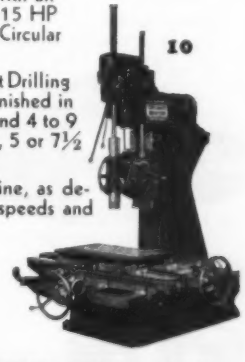
7. The SUPER SERVICE High Production Manufacturing Type Uprights have many of the advantages of the general purpose drilling machines but, due to their simplified construction, they are much more economical. They are furnished in 21", 24" and 28" sizes with 3, 5, 7½ or 10 HP driving motors. Booklet U-27 will furnish you more complete details.



8. The new SUPER SERVICE Precision Drilling Machine is especially suited to operations in conjunction with an automatic spacing table. This 36-speed 18-feed 15 HP motor machine is more completely described in Circular FH.

9. The SUPER SERVICE General Purpose Upright Drilling Machines, as described in Booklet U-25, are furnished in 21", 24" and 28" sizes. From 8 to 12 speeds and 4 to 9 feeds. The machines are powered by either 3, 5 or 7½ HP motors.

10. The SUPER SERVICE Jig Boring Machine, as described in Bulletin U-26B, is furnished in 12 speeds and 9 feeds with a 3 HP driving motor.

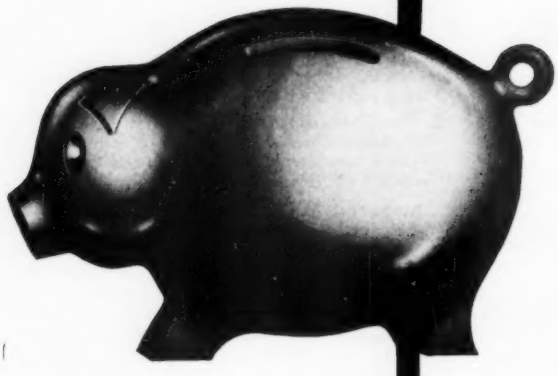


Equal Efficiency of Every Unit Makes the Balanced Machine

THE CINCINNATI BICKFORD TOOL CO.

Oakley, Cincinnati 9, Ohio, U.S.A.

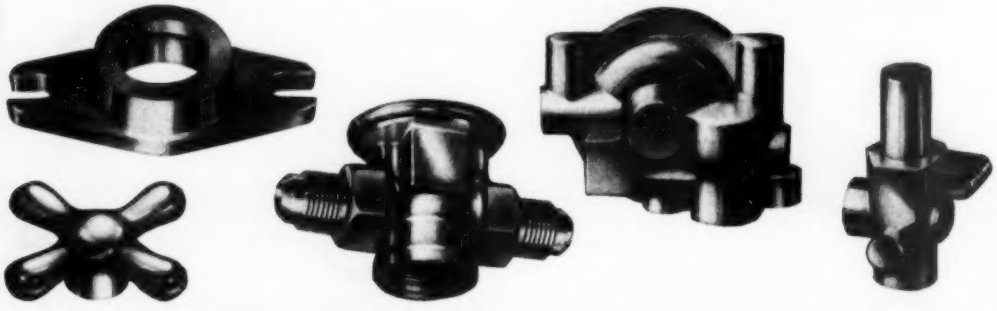
you save material dollars
you save machining dollars
you save tool dollars



with MUELLER BRASS CO.
forgings

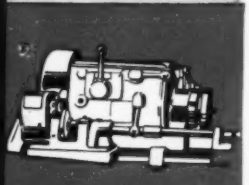
55

Your savings add up in a hurry with Mueller Brass Co. forgings. You save material. Brass and bronze forgings have a tensile strength at least 50% greater than sand castings. This eliminates all unnecessary weight and reduces overall material costs . . . You also save machining and finishing time. Since the dimensions of forgings can be held to much closer tolerances, there is less material to remove by machining. Also the finishing time required for plating or polishing is greatly reduced by the smooth, natural finish of brass and bronze forgings . . . You save tool dollars. The absence of surface scale greatly lengthens the life of machining tools. The dense homogeneous structure of forgings eliminates scrap due to sand holes and other material scrap . . . Where appearance, strength, and cost of manufacture is important, it will pay you to specify Mueller Brass Co. brass and bronze forgings. Write today for the cost-cutting details.

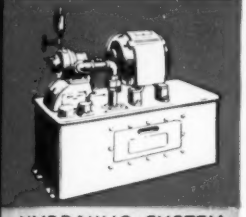


MUELLER BRASS CO., PORT HURON 18, MICHIGAN

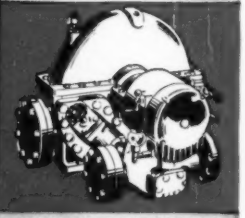
SPEED REDUCER



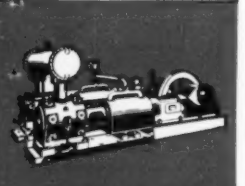
HEAD STOCK GEARS



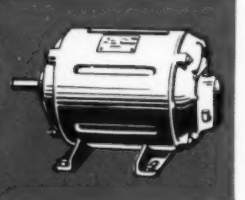
HYDRAULIC SYSTEM



AUXILIARY TURBINE



COMPRESSOR



MOTORS

Now better than ever

NEW

STANOIL
TRADE MARK
Industrial Oil

Brings two new benefits to wide range of jobs

For 14 years, STANOIL Industrial Oils have proved their ability to handle a wide variety of jobs in midwest plants. Now, these established products have been made better than ever! They offer these new and important savings in an even wider variety of industrial equipment.

1 LONGER OIL LIFE

Because they have greater oxidation stability, the new STANOILS stand up under high temperatures of operation, maintain low acidity for longer periods of service which helps keep oil systems free from deposits caused by oil oxidation.

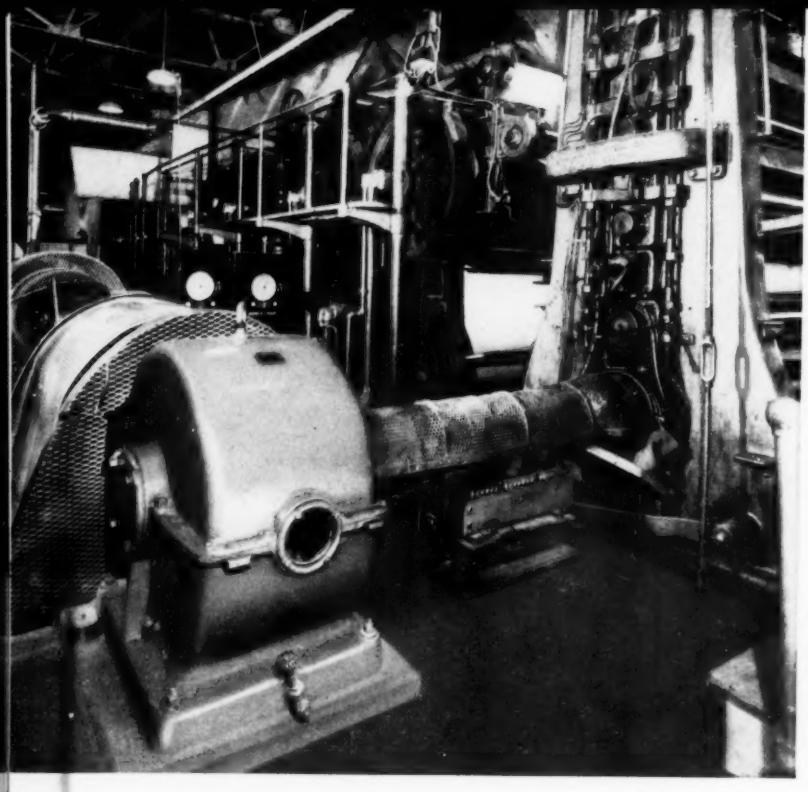
2 GREATER PROTECTION against RUST

A corrosion inhibitor of the most advanced type has been added to all grades of the new STANOILS that benefit by such an additive. This inhibitor prevents corrosion trouble by "plating out" on surfaces that tend to rust. In such severe service as paper-machine and steam-turbine lubrication, new STANOILS have put an end to rust and corrosion troubles.

At the left are shown several types of equipment in which the new STANOILS can save you money and maintenance time. A Standard Oil lubrication specialist will help you find still other applications where versatile STANOILS can replace many special-purpose oils. You can reach this man quickly and easily through your local Standard Oil Company (Indiana) office. Contact him today. Or, if you wish, write: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA)

STANDARD



What's YOUR problem?

R. R. Rowlands of Standard Oil's La-Crosse, Wisconsin, office is the lubrication specialist who helped this midwest paper mill (see left) solve a serious problem by recommending STANOGEAR EP Lubricant.

Standard's lubrication specialists are located throughout the Midwest. One of them is within easy reach of your plant. You can contact him simply by phoning your local Standard Oil Company (Indiana) office. His experience and special training will help you get maximum benefits from STANOGEAR EP Lubricant and other outstanding products such as

SUPERLA Greases—Available in a wide range of consistency grades and in both lime-soap and soda-soap types. SUPERLA Greases cover a wide range of operations. These efficient products are comparable in quality with the highest type of special greases.

STANOLITH Greases—Because these unique lithium soap products possess the heat resistant properties of soda-soap greases and the water resistant properties of lime-soap greases, they offer a solution to lubrication problems caused by the presence of both heat and water.

CALUMET Viscous Lubricants—On open gears and wire rope, these greases strongly resist washing and throw-off. Their superior wetting ability affords better coating of gears, better lubrication of wire rope.

STANORUST Rust Preventives—The eight grades of STANORUSTS form one of the most complete and effective lines of rust preventives on the market today. Each has been scientifically and specifically developed for its intended use. The grades range from a fingerprint remover to a heavy grease type product that protects against corrosion for years under the most severe outdoor exposure.

Helps gear units keep their teeth...

HEAVIER LOADS and higher speeds brought trouble to 16 large gear units used for driving paper machines at a midwest paper mill. Under the more punishing conditions of temperature and pressure, the lubricant in the gear sets deteriorated rapidly and had to be replaced every three to four months. Of even greater concern to plant operators was the pitting of gear teeth surfaces—a real threat to uninterrupted operation of paper machines and to plant economy.

The problem was put to a Standard Oil lubrication specialist. He pointed out that the lubricant in use did not have the extreme-pressure characteristics necessary to maintain strong, protective films of oil in the face of high gear loads. Upon his recommendation, the gear cases were drained and cleaned, then filled with STANOGEAR EP Lubricant.

In two years of continuous operation—24 hours a day and 6 days a week—the original fills of STANOGEAR EP have shown no appreciable deterioration and have not needed to be replaced. Plant officials report that the gears show no measurable wear, that pitted surfaces are polished and in excellent condition, and that gear cases are clean.

STANOGEAR EP
REG. U. S. PAT. OFF.
Lubricant

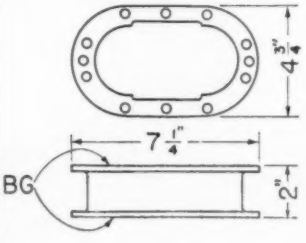
Why not utilize the Standard Oil service employed so successfully by this company? The combination of expert engineering and high quality products can help you solve a specific problem or gain greater all-around economy. How you can put this service to work for you, quickly and easily, is explained at the right.

Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD **STANDARD OIL COMPANY (INDIANA)**

BLANCHARD *is BEST...*

for roughing and finishing parts such as these



Pump bodies are typical of a wide variety of jobs requiring one operation to remove stock from the rough casting, then a finishing operation for extreme flatness and close size tolerances.

For heavy roughing, use the Blanchard No. 18. On this job, 22 pump bodies are rough ground in one chuck load. .100" is removed per side.

For accurate finishing, use the Blanchard No. 18. 16 pump bodies are finished in one chuck load to a tolerance of ±.0003" and flat to .0003" to assure a tight joint.

For fast heavy roughing or accurate finishing, use the Blanchard No. 18. These parts are produced at the rate of 38 pieces (76 surfaces) per hour.

Send for your free copies of "Work Done on the Blanchard," third edition, and "Art of Blanchard Surface Grinding."

PUT IT ON THE BLANCHARD

THE BLANCHARD MACHINE COMPANY 64 STATE ST., CAMBRIDGE 39, MASS., U.S.A.

NIAGARA

Niagara No. BI-5x30 Gap Frame Double Crank Inclinable Press fitted with magnetic perforating dies made by S. B. Whistler & Sons, Inc., Buffalo, N. Y.
Press equipped with air-actuated electrically controlled sleeve clutch.

Write for Specifications

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

PRESENTS The NEW

No. BI-5x30 Double Crank Gap Frame Inclinable Press with one-piece welded steel frame

- Gives full support to wide dies, impossible to obtain on the conventional single point Inclinable Press even with slide flanged out.
- Gibbing may be brought closer to point of load application on this double crank press than with flanged slide single crank design.
- Two point suspension resists tendency of slide to tilt under off-center loading conditions.
- Niagara gap frame construction gives equal access to all four sides of die. No ribs or shafts extending across the back of press.
- Inclined position permits finished work to drop off the rear of the press.
- Gearing enclosed and running in oil.
- Backshaft mounted on anti-friction bearings.
- Air counterbalance for slide.
- Bronze bushed main and connection bearings.
- Niagara electrically controlled air actuated sleeve clutch.
- Air releasing brake.

Similar presses are made in sizes ranging from 3½" to 6½" diameter shaft. Sizes 3½" and 4" are made with mechanically operated sleeve clutch.

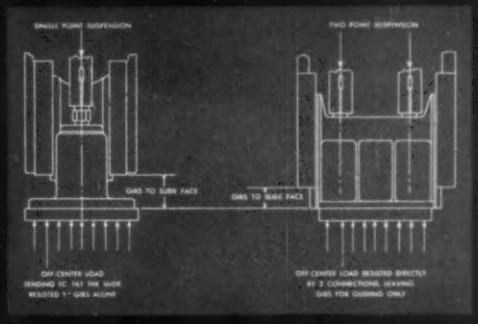

SINGLE POINT SUSPENSION
TWO POINT SUSPENSION
GIBS TO SLIDE FACE
GIBS TO SLIDE FACE
OFF CENTER LOAD TENDING TO TILT THE SLIDE RESISTED BY GIBS ALONE
OFF CENTER LOAD RESISTED DIRECTLY BY 2 CONNECTIONS, LEAVING GIBS FOR GUIDING ONLY

Illustration shows Niagara No. BI-5x30 press in inclined position.

Manufacturers of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work

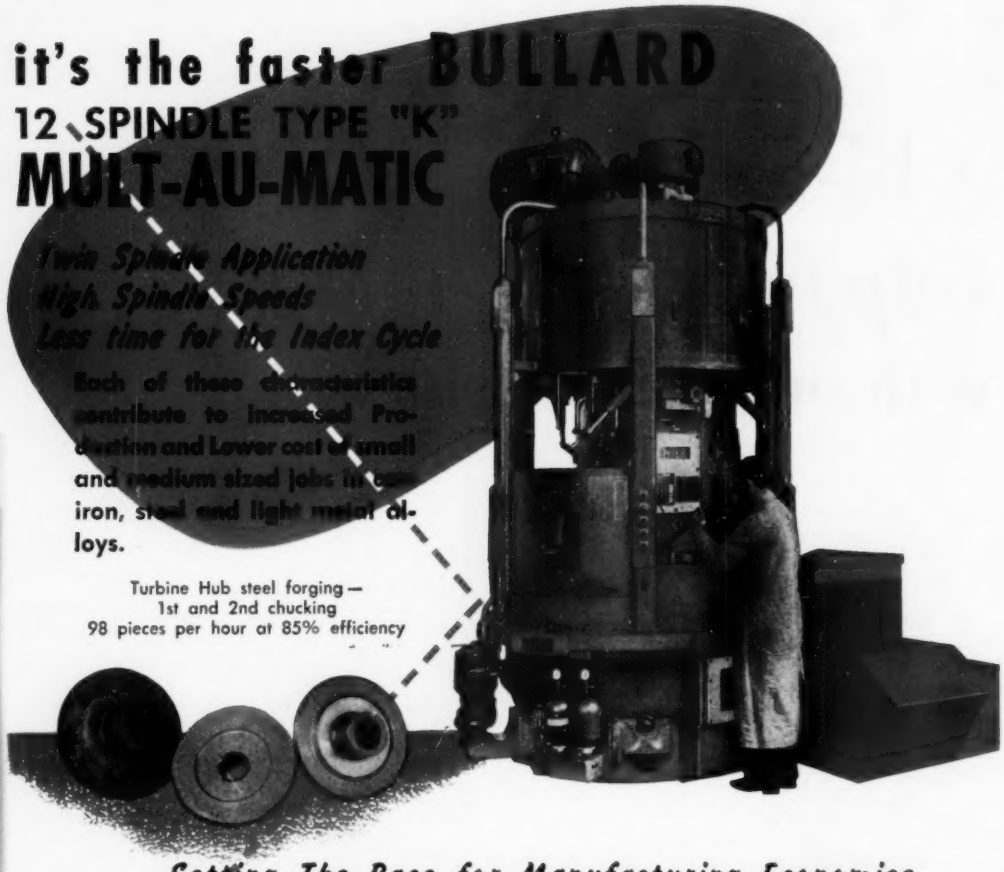
DISTRICT OFFICES: DETROIT • CLEVELAND • NEW YORK

it's the faster BULLARD
12 SPINDLE TYPE "K"
MULT-AU-MATIC

Twin Spindle Application
High Spindle Speeds
Less time for the Index Cycle

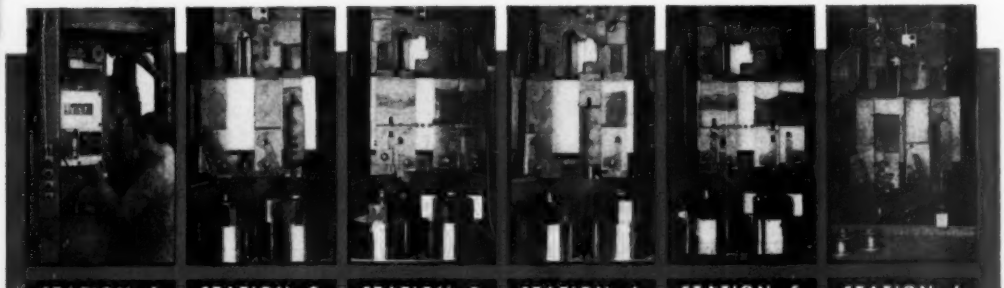
Each of these characteristics contribute to increased Production and Lower cost on small and medium sized jobs in cast iron, steel and light metal alloys.

Turbine Hub steel forging —
1st and 2nd chucking
98 pieces per hour at 85% efficiency



Setting The Pace for Manufacturing Economies

There are 19 operations combined in the 1st and 2nd chuckings. Each index of the machine delivers a finished piece. When writing for information refer to ad XK



THE BULLARD COMPANY
BRIDGEPORT 2, CONNECTICUT

HERE'S YOUR CATALOG OF ILLINOIS TOOL WORKS CUTTING TOOLS CARRIED IN STOCK. HANDY SIZE—EASY TO USE! SAVES TIME—HELPS YOU GET WHAT YOU WANT FASTER!

Now you can have immediate service on a wide range of Illinois Tool Works cutting tools from our standard stocks which have just recently been expanded by adding more than 150 new sizes and types. Our new stock list has been designed for quick, easy reference. Its convenient pocket size, attractive type arrangement and listings that conform to the new American Standard make it a practical buying guide. This new Stock List will be published quarterly — complete with prices and discounts—get your name on our mailing schedule, now! Illinois Tool Works, 2501 N. Keeler Ave., Chicago 39, Ill.

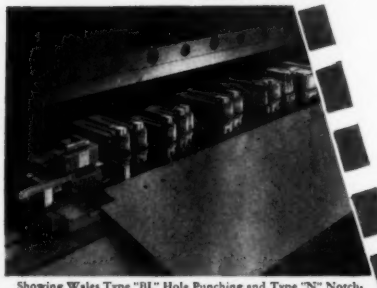
HEADQUARTERS FOR ENGINEERED CUTTING TOOLS

ILLINOIS
TOOL WORKS

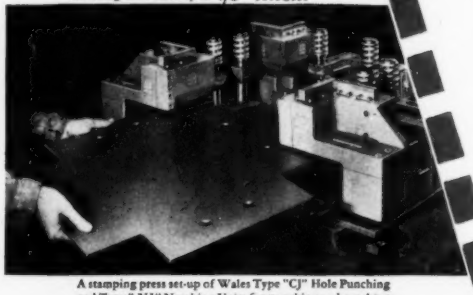
Punching ⅛, ¼, ½" thick mild steel

THERE ARE WALES HOLE PUNCHING UNITS TO DO THE JOB

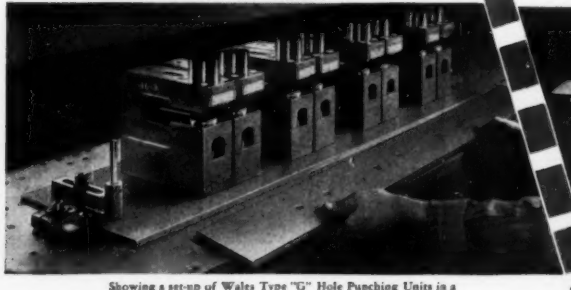
AND NOTCHING UP TO 1/4" THICK MILD STEEL



Showing Wales Type "BL" Hole Punching and Type "N" Notching Units in a combination press brake set-up for punching and notching mild steel up to **1/8" THICK.**



A stamping press set-up of Wales Type "CJ" Hole Punching and Type "NJ" Notching Units for punching and notching mild steel up to **1/4" THICK.**



Showing a set-up of Wales Type "G" Hole Punching Units in a press brake for punching mild steel up to **1/2" THICK.**

Same Wales Type "G" Units as shown at left in a stamping press set-up for punching mild steel up to **1/2" THICK.**

● Only America's most complete line...the Wales Line...can provide the exact *standard* hole punching unit required for any thickness of metal up to ½" thick.

In most applications, hole punching and notching may be accomplished in the same operation on both stamping presses and press brakes. Wales independent, self-contained units which hold the punches and dies in permanent alignment permit set-ups to be made outside the press and placed on press bed reducing expensive press "downtime" to an absolute minimum. Die sets are not necessary with Wales self-contained Units.

The *multiple* time-saving, money-saving advantages of Wales Hole Punching and Notching Equipment is too BIG a story to tell in this space, so write for fully-illustrated, functionally colored catalogs TODAY.

WALES-STRIPPIT CORPORATION

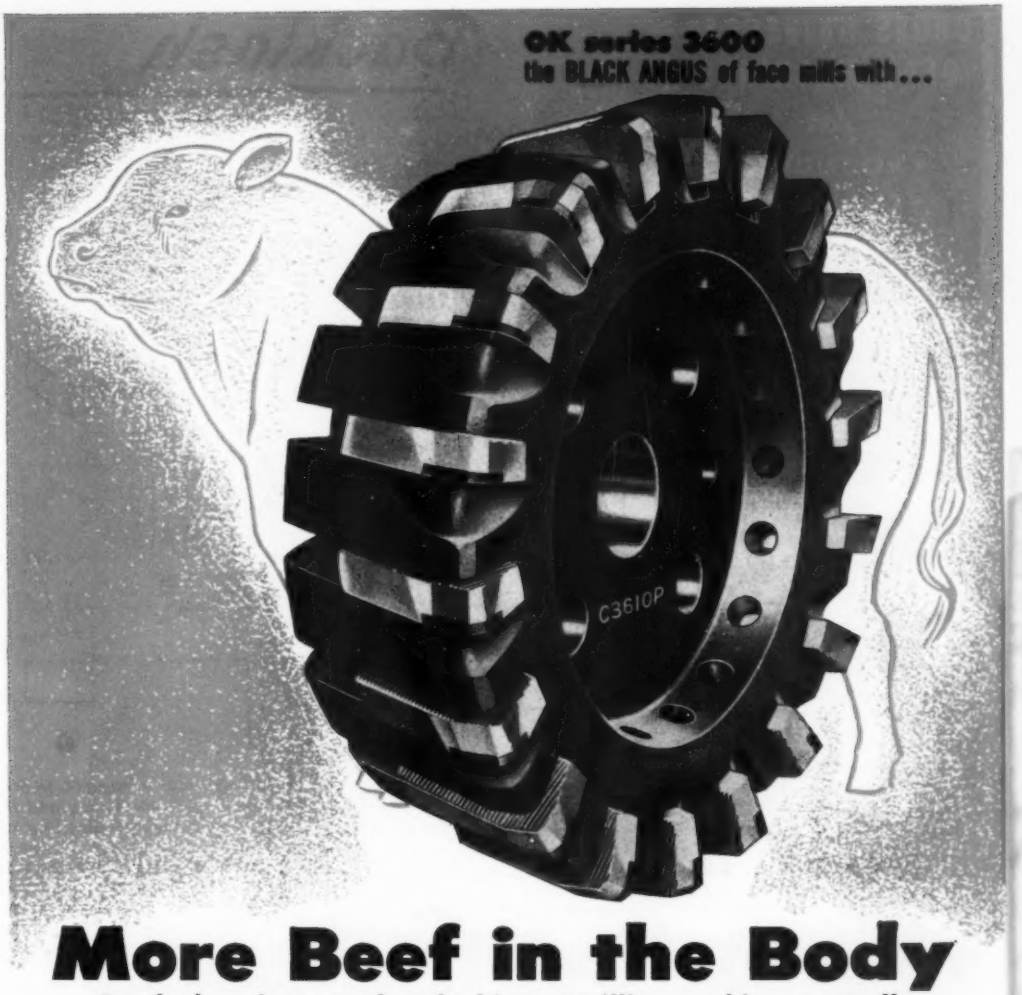
GEORGE F. WALES, *Chairman*

373 PAYNE AVE., N. TONAWANDA, N. Y.

(Between Buffalo and Niagara Falls)

WALES-STRIPPIT OF CANADA, LTD., HAMILTON, ONTARIO

Specialists in Punching and Notching Equipment



More Beef in the Body

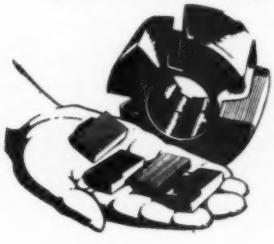
For the heaviest cuts that the biggest milling machines can pull.

OK Face Mills, size for size, have more weight, more substance, more beef in the body. And blades are huskier with a greater proportion of carbide available for cutting. It is a proven fact these cutters remove more metal in a given period than other cutters *which are complicated and weakened by recesses for screws, pins, gibs or locking devices.*

OK cutters consist of just two components — the body and the blades. Blades are simple wedge-shaped blocks, serrated on one face with matching serrations in the body. They are solidly seated by a driving fit, easily extracted with a drift, and stay put under the fastest speeds and heaviest feeds. The simple strength and ruggedness permit the placement of more blades in the fine pitch series and heavier blades in the coarse pitch series.*

You need the OK competitive advantages. Take your toughest job and let OK engineers have a go at it.

***The wedge is the world's simplest and strongest basic mechanical device.**



OK

modern milling cutters for modern milling machines

THE O.K. TOOL COMPANY, WILTON, N. H.

Division Williams and Hussey Machine Company, Inc.

CROSS UNIVERSAL GEAR MACHINES

for

- ROUNDING
- CHAMFERING
- POINTING
- BURRING

Cross Universal Gear Machines embody advanced engineering developments to obtain highest productivity and assure lowest possible operating costs.

They feature utmost flexibility for handling a wide variety of gears. Continuous cutting motion, exclusive with Cross, speeds production at top efficiency.

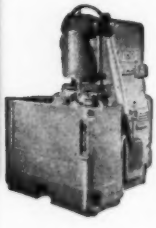
Special skill is not required because machines are automatic and push button controlled. Power clamping is foot pedal controlled. Both hands are free for work handling.

No. 55

For rounding, pointing, chamfering or burring external and internal:

spur gears
helical gears
clutches
splines

Typical productivity when rounding or pointing 8 pitch 30 tooth gears is 55 net hourly.



No. 65

For pointing or chamfering external and internal:

clutches
spur gears
bevel gears
splines

Typical productivity when pointing 10 pitch 30 tooth gears is 100 net hourly.

No. 75

For burring or chamfering both ends at the same time.

helical gears
spiral bevel pinions
hypoid pinions

Typical productivity when chamfering 8 pitch 40 tooth gears is 200 net hourly.

THE CROSS COMPANY
Established 1898
SPECIAL MACHINE TOOLS
MILLING • DRILLING • TAPPING • BORING
TURNING • SHAPING • GRINDING • HONING
DETROIT 7, MICHIGAN

Backlash

EXTRACTS FROM CURRENT LETTERS TO THE EDITORS

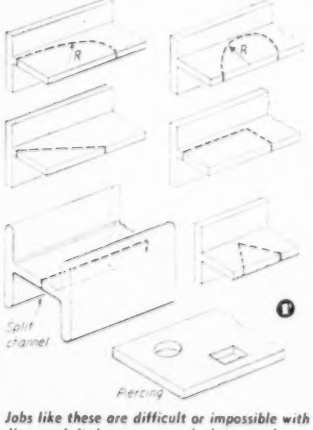
How to Punch and Shear Structural Shapes

Readers have asked us several times how to do the jobs shown in Fig. 1. As there is a seeming dearth of information about punching and shearing structural shapes, we submitted the problem to L. C. Beatty, president of the Beatty Machine & Manufacturing Co., Hammond, Ind. His firm builds power punching and shearing machinery, and of course advises customers on difficult tooling problems.

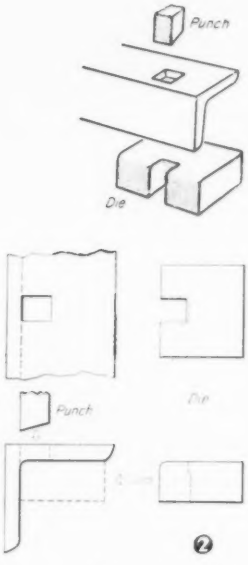
Here is what Mr. Beatty says:

"Believe me, you submitted some 'tough' problems. All of your sketches involve blanking or shearing the web of a T-bar or channel, the cut being stopped usually at a short distance from the vertical leg. This is the difficult part of the problem, because not enough space is allowed to mount a lower shear blade.

"During World War II, we made up two sets of tools for a manufacturer, who wished to punch either square or rectangular holes in angles, so that one side of the hole coincided with the vertical leg, Fig. 2. For this job, we used a punch



Jobs like these are difficult or impossible with dies, and it is more practical to torch cut



with a sheared or tapered leading surface, so it tends to dig into the material and prevent thrusting the angle away from the die. The lower die supports the material in the back and on the two sides, but the vertical leg of the angle serves as the lower die across the face of the punch. This scheme worked satisfactorily, and replacement of punches and dies was not excessive.

"I am unable to suggest a method for coping the T's, as sketched in Fig. 1. The material between the end of the cut and the vertical leg would have to be supported in some way to prevent its bending and tearing down. In most cases of the kind, it is more practical either to change the structural shape or to torch-cut the part.

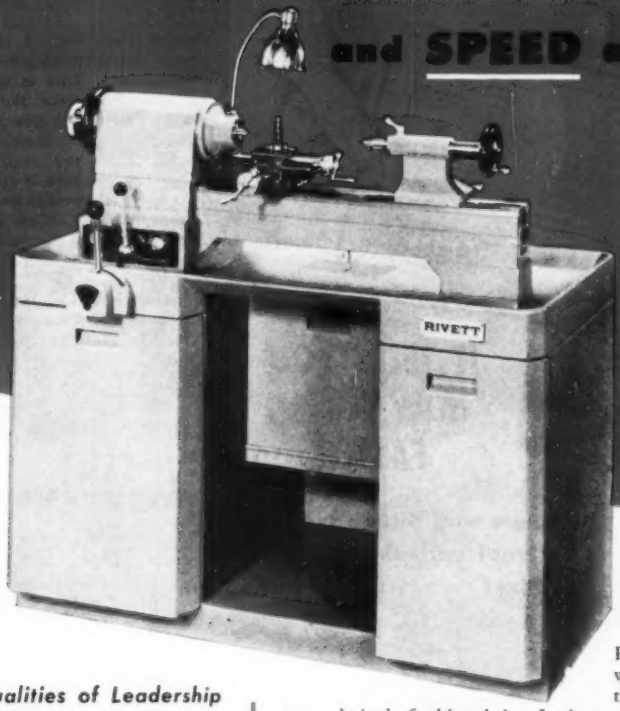
"When punching thick materials, the following die clearance is normally used:

For holes 0 to 7/16 in.—die 1/32 in. larger than punch.

For holes ½ in. and over—die 1/16 in. larger than punch. However, the theoretical formula for die clearance is: die diameter equals thickness of plate $T \times 0.06$ plus the punch diameter."

three is NOT a crowd—

when PRECISION, POWER, and SPEED are together!



and all three are in the

RIVETT 918 "STEELWAY" Cabinet Lathe

Qualities of Leadership

Any one of 90 to 3750 R. P. M. cutting speeds instantly selected through convenient control and dial indication.

Double-Bevel steel ways, hardened and ground, provide positive centering action.

Collets have greater precision and gripping power with spacing of bearings doubled.

Self-aligning slide rest automatically squares itself with line of centers.

Convenient lever chuck closer may be equipped with switch to control spindle drive and brake.

Power and speed combined with the inherent precision of this 9″ Rivett make it the most desired of cabinet lathes. In the toolroom it produces a precision part in a fraction of the time required to set up a larger, cumbersome machine. On production it manufactures an endless variety of duplicate parts in small or large lots to interchangeable limits. Versatility of the 918 "Steelway" Rivett is further assured with the many efficient attachments available for milling, grinding, slotting, and thread chasing.

No single machine tool is capable of filling as many wants in production, tool room, and laboratory as the 918 "Steelway" Rivett. For proof of what it will accomplish for your needs, write for **Bulletin No. 918-SL.**

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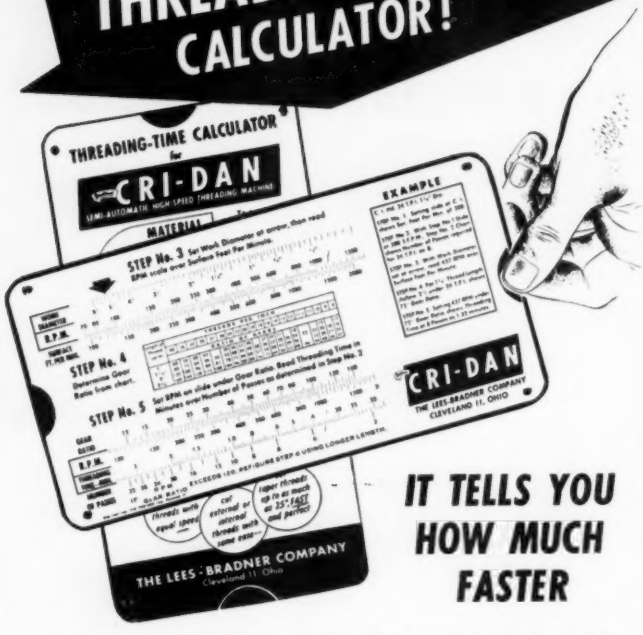

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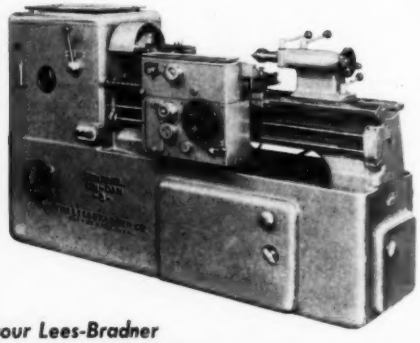
you can generate *any* single start thread profile up to 4" external — 6" internal with the Cri-Dan Single Point Threading Machine!



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The LEES-BRADNER Company

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Attaching Rotating Band

We are engaged in quantity production of 20-millimeter shells. We are writing to ask you if you could give us the names of the manufacturers of the special press used in the Arsenals for the squeezing of the copper rifling ring into the knurled groove near the base end of the shell.

Jean Canuel,
Works Manager
Société Nouvelle
des Etablissement Brandt, France

During World War II, the West hydraulic shell-banding machine was widely used. This is a unit with six dies that force the band into place. Controlled pressure is applied for a given time, then is released. After the shell is rotated about 15°, pressure is applied again. This cycle is repeated until the band has completely filled the groove. Manufacturer of this machine is The West Tire Setter Co., 401 Exchange St., Rochester 8, N. Y. The Fenn Manufacturing Co., Hartford, Conn., also produces a rotary swaging machine that can be applied to shell banding.

Die-Casting Plaudit

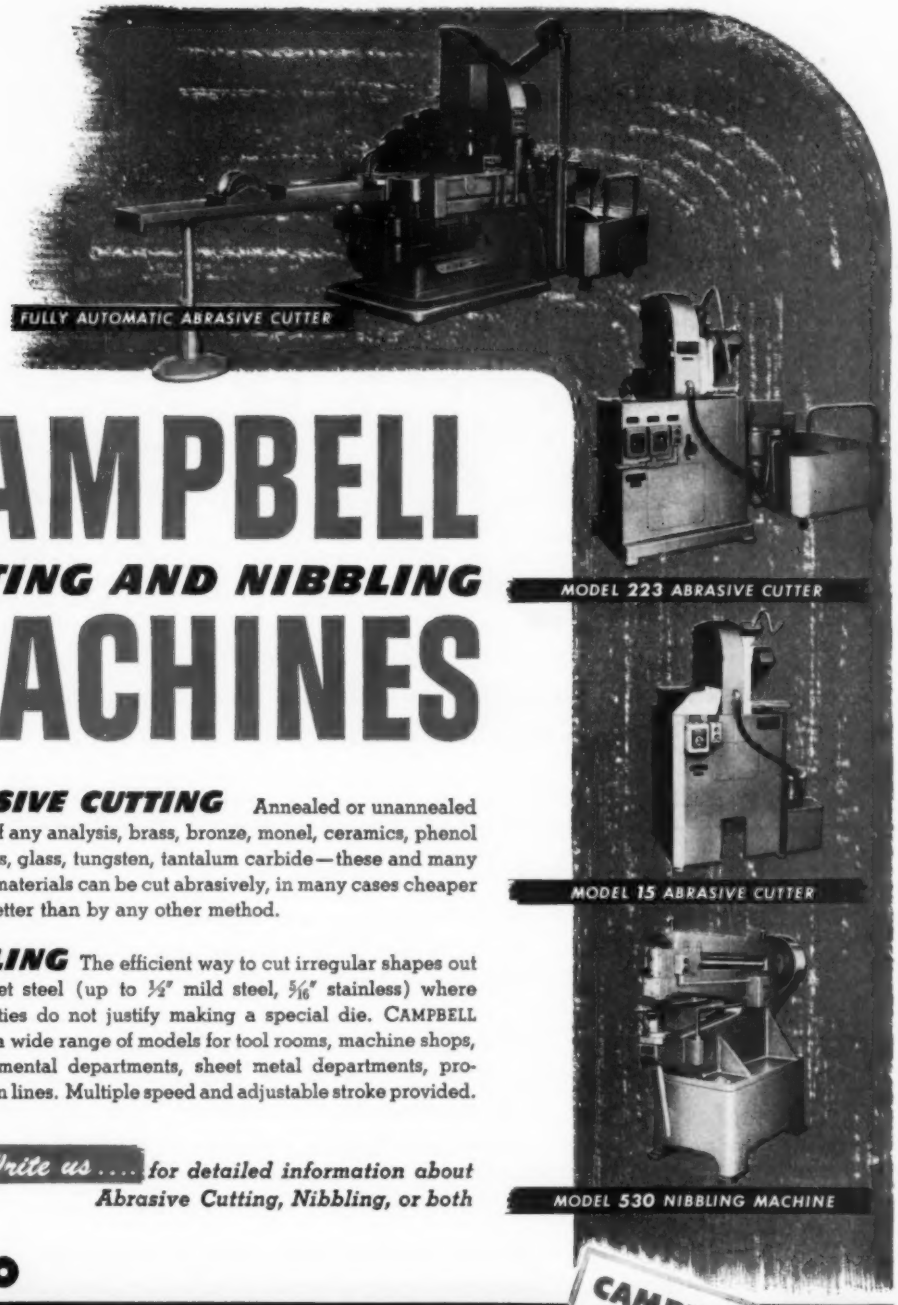
I have just read a copy of "A Special American Machinist Report to the Metalworking Industries" entitled "How to Make Die Castings" by James Van Voast, dated Dec. 18, 1947, pages 103 to 118.

In my opinion it is the best and most concise treatise I have ever read on this subject. I have read several books and articles on die casting, but all of them just generalize on this subject. After you have finished reading them, you feel as if the time spent was wasted. This article is entirely different and it covers all phases of this industry fully when you consider the number of pages.

I imagine it is rather late to ask for a reprint of this article, but I sure would like to get one.

V. Broezell
Chief Engineer
Mid-Western Die Casting Co.

Copy located and sent.—Ed.



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SPOT NEWS of Metalworking

- **Phantom orders, perhaps up to 45% of total now in hands of machine tool builders,** are likely to be converted into "live" orders in next 30-45 days. For details, see Machine Tools, page 121.

- **Curtiss-Wright is reported** to be negotiating a contract to make the Sapphire (British) jet engine for shipment to British plane manufacturers as well as for the U.S. aircraft industry.

- **Selective Service has turned a deaf ear** thus far to pleas of contract tool and die shops to defer young journeymen. It feels that a man under 26 has not had enough experience to be valuable to industry. Contract shops say that youngsters begin at 17, become journeymen at 21, then are trained for four more years beyond that.

Galvanized steel tubing instead of copper and plastic trim in place of stainless steel are to be used by a prominent refrigerator maker. Another appliance manufacturer is substituting fiber glass for aluminum in certain applications.

- **Hardness of stainless steel has been doubled by new process** unexpectedly discovered as outgrowth of routine tests, Westinghouse reports. Westinghouse scientists found that certain handling at —300 F. gave magnetic effect to one of samples in batch of stainless steel samples from Crane Co.' laboratories. Subsequent studies, in cooperation with Crane, showed that rolling at lowest temperatures brought highest hardness and strength values.

- **An employer does not violate free speech limits** of Taft-Hartley Law when he tells his workers he would rather deal directly with them than through a union. NLRB so decided in declining to declare invalid an election at General Electric's plant at Anaheim, Cal. Management had sent a preelection letter to all employees, but made clear that relations still would be friendly if the union won. Left-wing UEW lost the election.

Negotiated contracts for defense work are outnumbering advertised-bid contracts 9 to 1 since Washington decided to do most armament contracting by negotiation. Such procedure is used for munitions which (1) are urgently needed by combat forces; (2) can be secured only from a single supplier; (3) are in short supply; and (4) are of a highly technical nature.

- **New method of bonding rubber to metal,** known as Redux process, has been announced by Natural Rubber Bureau. Basic idea is to treat rubber surface with concentrated sulphuric acid, then thoroughly washing in running water and drying, then painting with thin coat of liquid resin. After that, coated surface is dipped in powder. Rubber and metal then are clamped together under pressure of 50 lb. per sq. in. and heated at 140 deg. C. for 20 min.

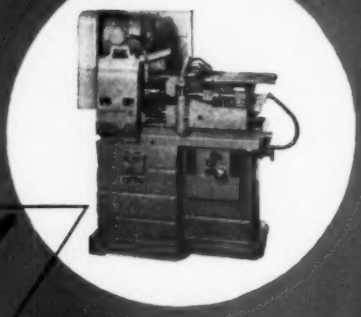
- **Ingenious lathe attachment for thread cutting,** developed in Germany, incorporates adjustable stop and spring-loaded tool carrier. When required thread length is reached, tool traverse is stopped, though carriage may continue to move for some distance.

- **Conventional ship lofting has been obsoleted in Sweden's yards** by application of a German process for projecting 9x12 cm slides onto steel ship plates. Slides are made photographically from precision drawings and incorporate a checking scale. Templet contours appear as white lines on plate, and steel is scribed by unskilled workers. Gotaverken yard applied method to 16,000-ton tanker; Germans used method for subs and small vessels only. Projection machine should be used high up in windowless plate shop, if possible.

- **Defense contractor may use his DO rating to get jigs, dies, tools and fixtures** for tooling for armament production, NPA ruling says. It is easier and quicker for him to extend his original DO number than to get a DO-98 which, if he has time, he is expected to do.

- **Kaiser-Fraser has leased plant** of Osborne Machinery Co., San Leandro, Calif., for subcontract work for aircraft companies. It expects to employ 2500, has option to buy at end of four years.

STANDARD



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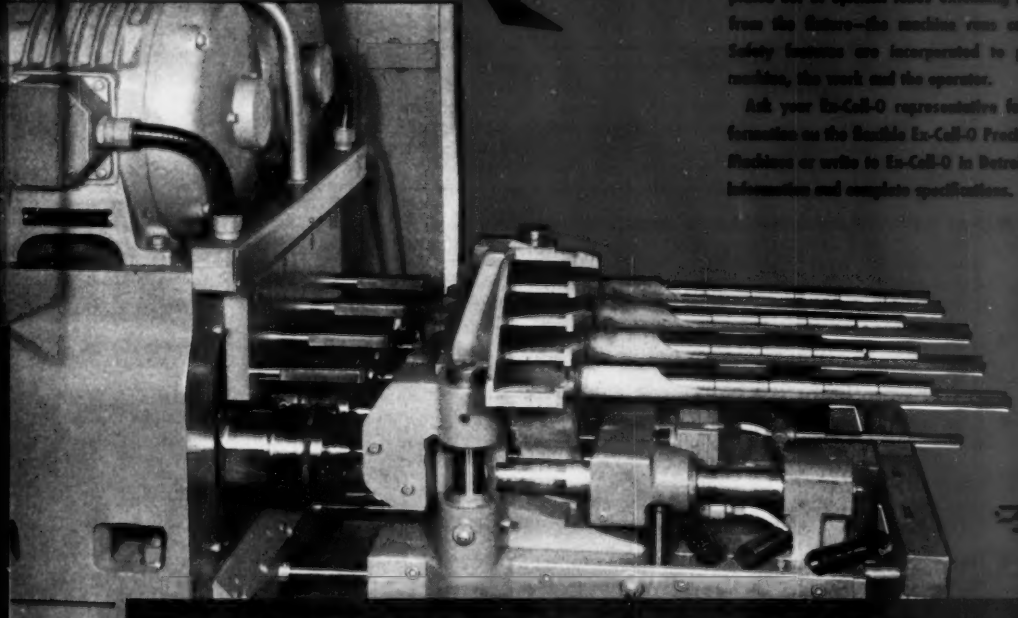
The machine illustrated here precision bores blind holes approximately 1⅝" diameter and 1¼" deep in gray iron hydraulic components. Parts are loaded into fixtured chutes and the finish-bored parts are picked out of ejection tubes extending horizontally from the fixture—the machine runs continuously. Safety features are incorporated to protect the machine, the work and the operator.

Ask your Ex-Cell-O representative for more information on the flexible Ex-Cell-O Precision Boring Machines or write to Ex-Cell-O in Detroit for more information and complete specifications.



EX-CELL-O CORPORATION DETROIT 32 MICHIGAN

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DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

Washington

Mobilization is still for defense, rather than war. Military spending this year, including arms aid, still isn't expected to top $20 billion. And, it's now planned at less than $40 billion next year. This is in spite of total appropriations in the two years for U.S. mobilization and foreign arms aid forecast at over $100 billion.

• • •

But you get the best indication in manpower, where limits have been set on our fighting forces at less than 3.5 million men. It means two years—plus service for every young man that turns the age of 18.

Deferments are due to get much tougher. Many draftees now rejected will be called in the future. A system of limited service is being worked out for the handicapped. Object is to free as many men as possible for duty in combat units.

• • •

It may not be called that, but the net effect of changes now planned in the draft law will be universal military service.

Five years in the Reserve will be required of everyone following his period of active duty. The present part-time training program will be required for all Reserves and is due to be intensified.

Object is to build a corps of "minute men" 7-million strong that could be called and at the front in a matter of weeks instead of the months now needed.

Reserve record-keeping will be on an unprecedented scale. One Pentagon official estimates that with present methods it would take 20,000 more government employees to do this job alone.

With nearly all the male population due to become veterans sooner or later, new criteria for veterans' benefits must certainly result.

For instance, application of present medical benefits to the veterans of universal military service would simply be socialized medicine.

• • •

No effort will be made to maintain enough modern material on hand to equip the entire Reserve at one time. Sufficient weapons will be kept in storage to outfit certain critical units at a moment's notice.

A broad industrial base for the rapid expansion of munitions production is counted on to assure that the newest weapons would quickly be flowing to the front in volume.

The Pentagon calls it cutting down the time between D-day and P-day—the military's term for the day when war production goes into full swing.

• • •

The $350 million Congress appropriated to pay the total cost of building fifty 22-knot, 12,500 deadweight-ton cargo ships is a cautious beginning to what may grow into a much larger program.

Need for these ships is purely military. Any commercial use will have to be heavily subsidized.

• • •

Navy has abandoned any idea of moving materials of war by large convoy a la World War II. Any heavy concentrations of shipping in future wars will simply become priority targets for A-bombs and sonar directed, self-guiding torpedoes.

There's real fear that even these new ships may be too slow by the time the program is well under way. Navy's atom-powered submarine, due for completion within two years, will have a top underwater speed of over 45 knots. There's no reason to believe that Russia may not also be building one.

At least one U.S. steamship line is seriously considering the construction of a nuclear-powered merchant vessel. Designers are trying to find a hull-shape that would permit the speeds contemplated.

• • •

Primary concern of UN commanders in Korea is to keep forces and materiel intact. If the Reds decide to pay the heavy price it will take to drive us into the sea, the Allies want to be sure their forces are saved for possible use elsewhere.

• • •

That the French bazooka is better, and when produced in France, cheaper than ours, is admitted by U.S. Ordnance experts. But, the Pentagon insists on incorporating French improvements into the U.S. production model, rather than buying from the French direct.

It's against principles agreed to in the North Atlantic Pact, but military men everywhere are afraid of becoming dependent on foreign sources of supply.

• • •

Don't be fooled by reports of heavy shipments of arms under the Military Defense Assistance Program. It's twice-declared surplus materiel for the most part, manufactured during World War II. Its dollar value is low. Of the $6.5 billion appropriated for MDAP in 1950 and 1951, only $1 billion is due to be spent by June this year.

• • •

Defense production chief Wilson insists no serious long-term civilian shortages need result from the present rearmament program.

He's counting on rapid expansion of basic U.S. industries to take care of the shortages created by the sudden heavy demand for more weapons.

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Detroit

What are they saying in Detroit these days?

Here's the word from a top purchasing agent: "The vendors keep coming in for price increases. They're all coming in. Hold the line? How can the government hope to hold the line when it raises prices itself in rubber and OK's a raise in steel? The vendors are entitled to it—much as I hate to admit it."

From an assistant to an important automotive company president: "First Symington was supposed to approve those certificates of necessity. Now we understand it's Harrison. But he can't do it legally yet, as of today anyway. The certificates are piling up. So is everything else. We can't get anything done."

From the general manager of a substantial automotive supplier: "We're all right for the first quarter—got the materials in sight. Second quarter? We haven't any ideas. No releases from the companies. No materials. No nothing."

From the chief engineer of another major supplier: "We're so choked up with business for the next three-four months we don't know how to digest it. After that we have no idea where we're going."

From a large producer: "We had a big yowl from Ford when we raised prices in December. We told 'em the prices had to stick—we couldn't swallow that steel increase all alone. They're calmed down now."

From a sales agent of a small company: "I'm scared to death—Ford says they won't buy anything at higher prices, and we raised prices in December. What'll I do?"

From an industry tycoon just back from Washington: "I'm beginning to feel optimistic. Things are so blankety-blank screwed up down there they can't get any worse. I'm positive of that—seriously. From here on it's got to improve."

From a top auto company sales manager: "Business is terrific. Just look at these 10-day reports—don't take my word for it. Of course our competitors haven't got that kind of figures—only one of them has field stocks that low."

From the president of a major auto maker: "If you're serious about that new car, I'd suggest you get your order in pretty soon. I don't know anything to make me say that—let me emphasize that. But I'd be inclined to play it safe."

From a small company general manager: "I'd like to talk but—you'll have to excuse me. I just got a go-ahead on an order that'll come in the end of the month. I've got to hit the telephone and start lining up two tight materials. I'll probably have to go into the black market for one."

From a parts maker: "All this talk about big military business—where is it? That's all I want to know: Where is it?"

Those are actual quotations from actual people. They're taken from current conversations as typical of the views of many more beside the immediate speakers. They're Detroit in mental cross-section.

• • •

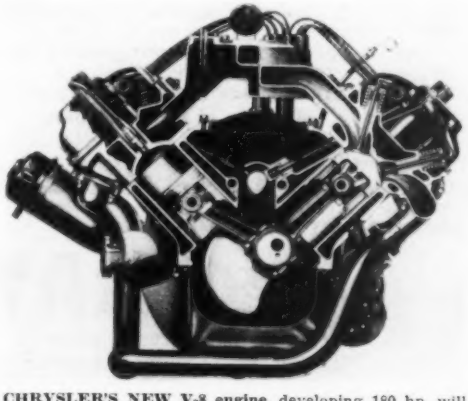
New engineering developments in the top Chrysler models bring the 1951 line up to date—and beyond. A brand-new engine, Hydraguide power steering, improved shock absorbers, air-cooled brakes, torque converter—all are aimed at reviving Chrysler's reputation as an industry technical leader.

It's the new V-8 engine, though, that has Chrysler bulging with pride. It develops 180 hp., claims to be the most powerful and most efficient (highest output per cubic inch of piston displacement) of any auto powerplant. One secret of its engineering: Hemispherical-shaped combustion chambers, long studied by auto engineers.

The new engine follows basic principles of high compression jobs, as first developed in the famous GM "Kettering engine" of a few years ago—short, stiff crank and block structure, short piston stroke, hydraulic tappets. A double breaker distributor makes a longer dwell angle for the spark—hence a more adequate spark. As it stands the engine can doubtless be much more intensely compressed, to take advantage of better gasoline when and if it comes along.

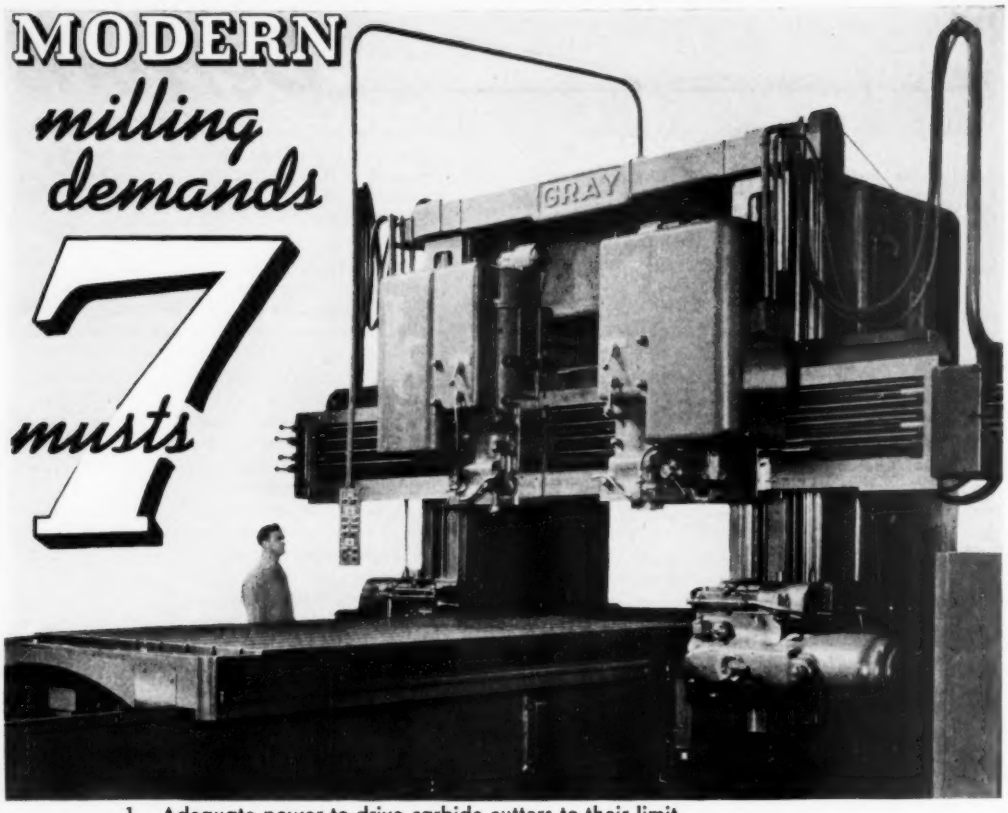
Smaller versions of the same engine will go into 1952 Dodges and DeSotos—maybe Plymouths, too.

The Hydraguide steering makes child's play out of turning of the heaviest Chrysler models. Power steering is nothing new; it has long been used in trucks; Chrysler people overcame the bugaboo that stopped others—where to find the space to install the unit.



CHRYSLER'S NEW V-8 engine, developing 180 hp, will power 1951-model cars

MODERN *milling demands* 7 *musts*



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Machine Tools

Placing of pool orders for machine tools is being seriously discussed in defense agency circles. There is some opposition, but it is believed that the preponderance of opinion is favorable.

This plan would mean that so-called "phantom orders" would be taken off the shelf and put to work. A large number of machine tool builders have "phantom orders" on file.

Pool orders would carry with them definite advantages. They would have DO ratings, which would give builders priority in securing materials and component parts. They also would enable builders to get government-guaranteed loans up to 30% of the value of each order. This money would be used to help finance expansion of production.

Still another useful purpose would be served by pool orders. They would "get off the hook" defense officials, who have steadfastly maintained that the only way in which machine tool builders can hope to obtain preferential treatment on materials is to secure more DO-rated business.

Funds to finance pool orders are not now in existence. They obviously would have to come from the armed services. It appears likely that when pool orders are allocated, they will go to builders direct from the Department of Defense, probably after having been screened by NPA's Machinery Division.

Don't look for these pool orders right away. It's a good guess that they will be an actuality in 30 to 45 days, however.

• • •

NPA's Machinery Division has asked machine tool builders to submit their order boards to it for private analysis. The entire procedure will be on a confidential basis. Object: to find out just how much business is for defense projects and what kind.

Phantom orders have been gone over by a team of machine tool men from builders' plants summoned to Washington by the Machinery Division of NPA. Purpose was to revise the orders to conform to today's needs.

Types and sizes were examined carefully to see whether they are the kind required to make armament being developed by the armed force.

These "paper" orders were looked at, too, with a view as to whether they will fit specifications of the British as well as Pentagon's.

• • •

British orders for machine tools placed with U.S. builders are to be given eventually an equal rating with direct U.S. defense orders, according to reliable Washington reports. The decision was the military's. This decision promises to "burn up" some U.S. prime contractors if their deliveries are deferred in favor of the British.

The truth is that the ratio of DO orders to the total in hands of U.S. builders varies widely. An informal poll at a recent gathering of builders showed some with only 2% of rated orders and others with 50% or more. The average, however, probably would not be over 15%.

But actual count of DO-rated business on the books doesn't tell the whole story. Many prime contractors, one an aircraft engine company, have placed vital machine tool orders without attaching any ratings to them.

• • •

Some 540 machine tools ordered from U.S. builders by the British for their armament production program will be given a priority rating immediately. These machines are of types which can be secured only in this country.

The British have been told by Washington to get whatever machines they can outside the U.S. British Ministry of Supply already has allotted pool orders valued at $20 million to English machine tool builders.

• • •

Other machine tool contracts let by the British are: $15 million to west German builders; $6 million to Swiss companies; and a smaller amount to Swedish manufacturers.

Three "schedules" of British machine tools to be bought in this country have reached Washington. They total around 2500 units. A fourth "schedule" is on the way. There's a hint that still more may come to U.S. builders later on.

• • •

A move to commandeer all ECA-ordered machine tools and hold them for later defense use has been started in certain Washington circles. The idea is to halt the export of these machines as they are completed. It doesn't matter whether they are wanted at once for a definite defense job. They would be held anyway.

ECA, needless to say, is strongly opposed to this procedure. It says that many of these machines are vital to get important ECA projects going in western Europe. Absence of one essential machine may impair investments totaling millions of U.S. dollars.

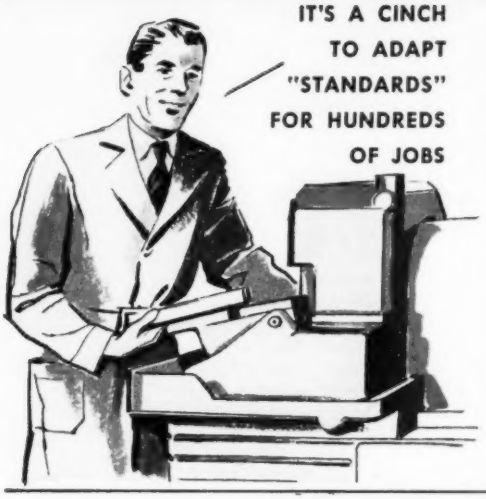
Some $230 million of U.S. industrial machinery is now on order for ECA. In addition, from $75 million to $100 million (including machine tools) are outstanding in so-called ECA non-project authorizations.

• • •

December orders for machine tools rose 20% in dollar volume compared with November. Foreign business contributed substantially. Shipments also jumped notably, as one would expect.

New orders booked for machine tools totaled some $710 million during 1950. Shipments are estimated to have been $305 million.

SPECIFY CARBOLOY



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- Maximum adherence to tolerances
- Maximum tool life
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. . . advantages that add up to maximum productivity — plant wide

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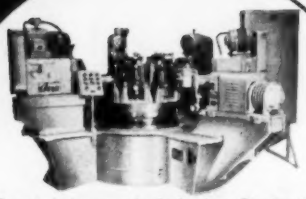

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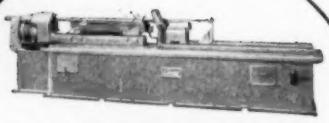

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- AUTOMATIC INDEX TABLES

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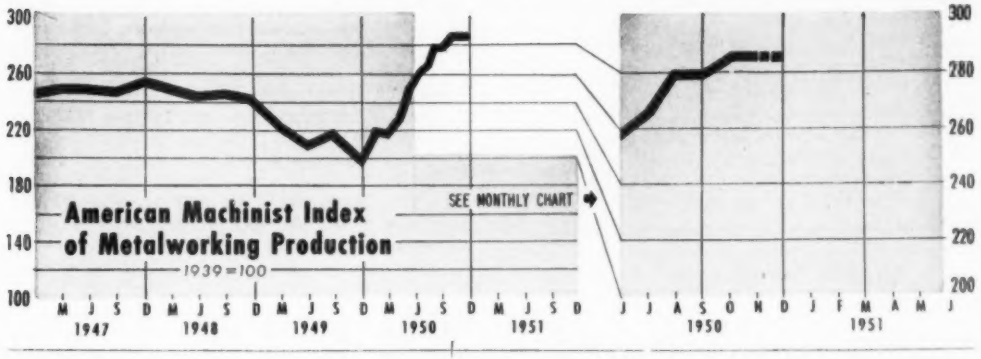
CINCINNATI 1, OHIO

WRITE FOR ENGINEERING CATALOG NUMBER 51

Gaging Metalworking



Metalworking Firms Get More Defense Work

The scramble is on for defense contracts in the metalworking industries. And the big problem is to maintain operations at a high level during the conversion period.

Government contracts are being let at a swifter pace. To name only a few: Chrysler will make J-48 Pratt & Whitney jet engines at a new plant outside Detroit. Lockheed is to produce bombers at Marietta, Ga., plant which Bell operated in World War II. Hotpoint is to build superchargers at a new factory at Milwaukee. Servel is to fabricate wings for F-84 Thunderjet fighters at Evansville, Ind.

• • •

Civilian goods output meanwhile is holding close to the fourth-quarter record pace. First-quarter schedule of prominent appliance company is only slightly below previous quarter.

Another appliance maker, on other hand, will be down much more in January-March period.

Automotive parts companies at Cleveland say that January's output will be on par with December. But first quarter will be 15% less than fourth quarter, sharp slashes coming in March or earlier. Heavy auto cutbacks may be made in the spring.

General Motors president C. E. Wilson has put on public record his belief that 1951 car and truck assemblies will be 6 million, as against 8 million last year. Most guesses up to now have been far under his figure.

• • •

Large farm implement maker expects to stay at December's high rate, or close to it, until April. Another farm machinery concern estimates its first-quarter volume will be down only 6%, but what second quarter will bring.

Railroad car builders have bigger schedules this month than last. But steel is not coming in as allocated by mills, and expansion is being delayed.

There is difficulty in getting balanced car sets, that is, enough of all sizes and shapes of steel needed in balanced quantities for building cars. And accessories people are having similar trouble.

Freight car orders piled up to 124,489 units at start of year. More cars were bought in 1950 than in any year since 1922. December production was 5700 cars, nowhere near the goal of 10,000 a month.

• • •

Industrial machinery builders say that January shipments will be up 5% from December. First quarter business will be 10% ahead of the final quarter of 1950, unless raw materials and component parts situation gets worse.

New defense spending keeps pushing up expectations for Metalworking this year.

INDEX

	DEC. '50	NOV. '50(p)	OCT. '50(r)	NOV. '49
	285*	**285**	**285**	**204**
Machinery		**266**	**261**	**187**
Electrical Manufacturing		**333**	**333**	**233**
Automobiles, Trucks		**258**	**264**	**176**
Transportation Equipment		**277**	**273**	**229**
Other Metalworking		**308**	**308**	**223**

AMERICAN MACHINIST'S INDEX OF METALWORKING PRODUCTION is based on manhours worked in the five components above.

*Estimated (p) Preliminary (r) Revised

Gaging Business

An additional $2 billion program for shipbuilding has the green light. And the housing industry is spurred by a new $3 billion plan for defense housing.

• • •

Armed services will spend more for tanks and automotive equipment this year than in any previous one, including World War II peak. Arms orders to the industry will exceed $4.5 billion.

• • •

Industrial employment in December was highest on record for that month. Non-farm workers rose to 54 million. Unemployed fell off to 2,229,000. Manpower supply continues to shrink.

• • •

Steel is getting tighter than ever. Wire seems to be as short as sheet, strip and plate.

Warehouses are limping along, with deliveries worse than ever. Allocations by mills are based on first nine months of 1950. But some warehouses are receiving 25% less than that. Some DO orders for steel have backed up to April.

Many steel users are able to secure only one-fourth their requirements from mills. They are shopping around for rest, paying fancy prices. Certain number are keeping going on foreign steel ordered last summer and fall.

• • •

Switch to gray iron castings from steel and aluminum is pronounced. But only 10% of castings business is for defense work. Backlogs run 9-10 weeks. Scrap and coke are big headaches.

Certain gray iron foundries are feeling effects of restricted use of non-ferrous metals by customers, who cannot find substitutes and are cutting back output.

• • •

Gear industry booked new orders in November equal to 554.9 on index of American Gear Manufacturers Association. That is down 1.8% from previous month. Index is based on 1935-1939 as 100.

Number of civilian goods makers are not laying off men or cutting hours, but are not replacing workers who quit, retire or die.

Manpower is greatest worry in contract tool and die shops. Though shops have biggest backlog since 1947, employment rose only 2% recently because so few skilled men could be hired.

November shipments by contract shops were up 44% from same month a year ago. First 11 months of 1950 showed gain of 25% over 1949.

• • •

Aviation industry will be able to turn out about 2000 planes a month by 1952. Aircraft people feel that production can be tripled in one year, with automotive makers helping.

Prospect is for employment of 500,000 by next summer in aircraft and supplier plants. That compares with 256,000 last June.

President's call for production capacity of 50,000 planes a year means a potential close to that in 1944, when 96,000 were built. That's because today four times the construction effort goes into plane manufacture as in 1944.

• • •

Almost all companies surveyed by Chicago Purchasing Agents Association paid higher prices in December. There has been virtually no rollback of prices to December 1. Over half the companies said that defense orders comprise 10% or less of their business. Some 35% have no government business at all.

Four out of ten declared that they are paying excessive prices for 10% of their production needs. Forty-four percent are paying no more than market prices for materials.

WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
Business Week Index of Activity (1923-25 = 100)*	230.0	230.9	195.5
Steel ingot operation (% of capacity)	102.7	101.8	97.2
Electric power output (million kilowatt hours)	6,602	6,479	5,695
Production of automobiles and trucks	100,337	135,229	116,768
Engineering construction awards (Eng. News-Rec., millions)	$415.8	$154.2	$193.5

MONTHLY BUSINESS INDICATORS

	Latest Month	Preceding Month	Year Ago
Refrigerators, domestic sales (thousands of units)	386	399	221
Vacuum cleaners sales (thousands of units)	265	331	254
Washers sales (thousands of units)	380	440	299
Household electric ranges sales (thousands of units)	128	135	59
Television receivers production	752	814	414
Home radio receivers production (thousands of units)	816	942	910
Gear sales index (1935-1939 = 100)	554.9	564.8	230.7
Foundry equipment new orders index (shipment 1937-1939 = 100)	885.5	526.8	270.4

* Seasonally adjusted.

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GREATER RUGGEDNESS — in base, column and sleeve, arm and head assures maximum precision. Carefully engineered balance gives sensitivity and ease of operation, too!

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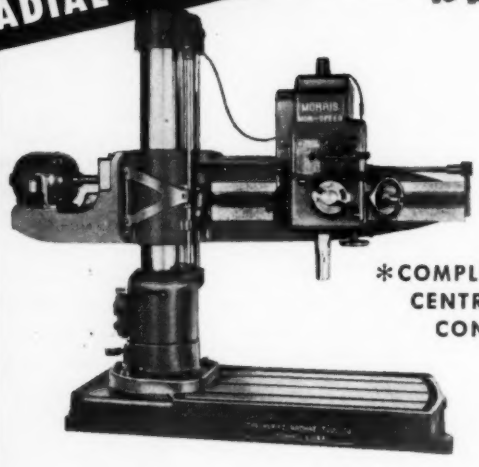

*COMPLETELY CENTRALIZED CONTROL

For more than 30 years, MORRIS *Mor-Speed* Radial Drills and Production Machines have been a standard of accuracy and low-cost production in all branches of industry. For further details on Morris Radial Drills, write for bulletins. If you have a problem involving production drilling, boring, reaming, facing or tapping in any combination of operations, consult Morris Engineers.

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American Machinist

MAGAZINE OF METALWORKING PRODUCTION ★ ESTABLISHED 1877

America's Power To Produce

President Truman has put two solid tasks on industry's shoulders.

One is to expand quickly our plane and tank manufacturing facilities. The other is to increase our capacity to produce.

"We must keep our economy strong for the long pull," the President declared in his "State of the Union" message. "Only by increasing our output can we carry the burden of preparedness for an indefinite period in the future."

THE IMMEDIATE JOB of providing capacity to make 50,000 planes and 35,000 tanks a year is largely a tooling task. It falls heavily upon production-equipment builders.

If the job is to be done with the greatest speed, builders must be given "the green light" by Washington to get materials and component parts. This isn't a trivial matter of whether we have pots and pans. It is crucial to our national safety.

The longer-term job of increasing our capacity to produce isn't merely one of constructing new facilities, as in steel. That is the major part of it, to be sure.

BUT BEYOND THAT is a difficult assignment of squeezing more production out of the physical capacity we already have.

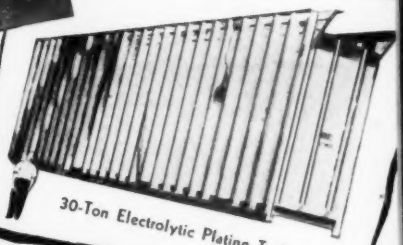
That should not be too hard, however, if two things are done. First, industry should put to use postwar-designed production equipment which is one-fourth to one-half more productive than the prewar machines to be replaced. Second, manufacturers should get the most out of existing shop equipment. They often don't.

When President Truman's objectives are attained, our nation will be in a very strong position to deal with world events as they arise.

AMERICA'S POWER to produce has won two world wars. It will be a major deterrent to any intentions Stalin may have to start a third world war. For he cannot be sure that this power may not again be a decisive factor in bringing victory to our side.

Burnham Finney

DO IT ON A VERSATILE Cincinnati Press Brake



30-Ton Electrolytic Plating Tank

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Automotive Products

Roll Tables for Steel Mill

Illustrations courtesy of Charles T. Brandt, Inc.

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In a highly competitive field, the powerful and versatile Cincinnati Press Brakes are profitable performers. They not only meet competition—they set the pace.

Write for catalog B-2A, describing operations, features, and special arrangements including wide beds and rams, bed and ram extensions, deeper gaps, higher die space and other features.

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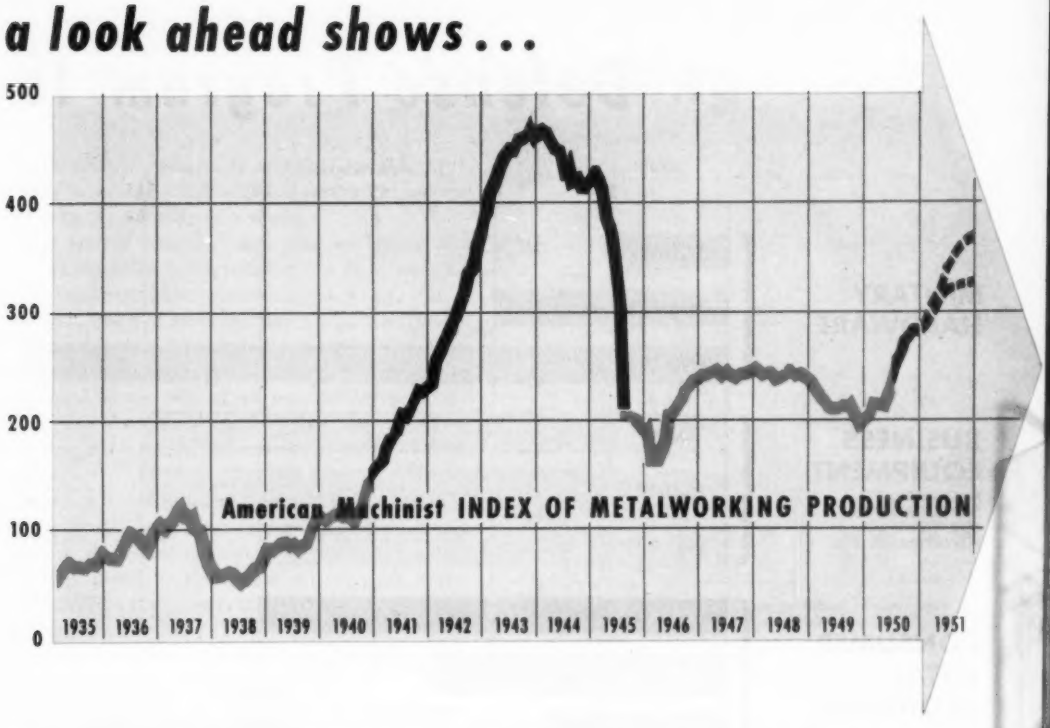
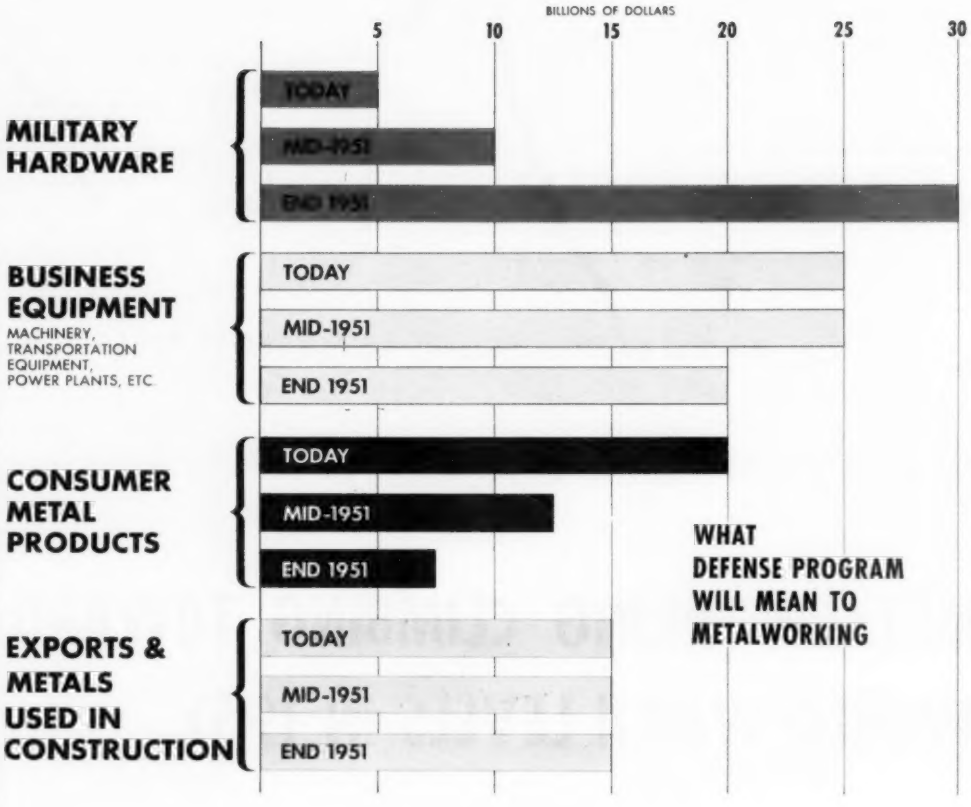


METALWORKING CLIMBING TOWARD WORLD WAR II LEVELS IN 1951

- *huge government spending for defense program*
- *record outlay for new plant and equipment*
- *substantial, but curtailed, civilian goods production*
- *heavy demand for all kinds of machinery*
- *increased controls over materials, manpower and prices*

AMERICAN MACHINIST METALWORKING FACTS FOR 1951

Defense Program to



METALWORKING is plunging into a year wrich will carry it to the greatest heights since World War II. The upswing is starting from a level almost three times as high as in 1939. Whether operations eventually will touch the 1943 peak will be determined by events now unforeseeable.

These prospects face Metalworking this year:

(1) Production will rise steadily, after a preliminary adjustment period, as the year wears on. By next December output will be on an annual basis at least 15% above today's.

(2) Military "hardware" will be manufactured at a rate of $30 billion a year by the end of the year. That compares with $5 billion now.

(3) Outlay for new plant and equipment will be up sharply (at least 20%) in U.S. industry. The gain in various segments of Metalworking will be even more, ranging from 19% in the "Machinery" category to 89% in the group comprised of aircraft, shipbuilding, rail equipment and other transportation aside from automobiles.

(4) Civilian goods production will shrink as defense requirements take a growing ratio of available materials, manpower and machines. The volume of goods for non-defense purposes will still be large during the first quarter. But it will have been cut alarmingly by the final quarter.

(5) Metalworking probably will be devoting one-

Dominate Metalworking

half or more of its capacity to defense work as 1951 comes to an end. That will compare with perhaps one-fifth for industry as a whole.

One should remember that Metalworking is the core of any defense program. For it is Metalworking that produces guns, planes, tanks, ships and a thousand and one other military items. Metalworking assumes even more importance in wartime than in peacetime. During World War II, Metalworking expanded to one-half of all manufacturing industries. The metalworking production curve now is heading into a bulge reminiscent of the 1941-1945 period.

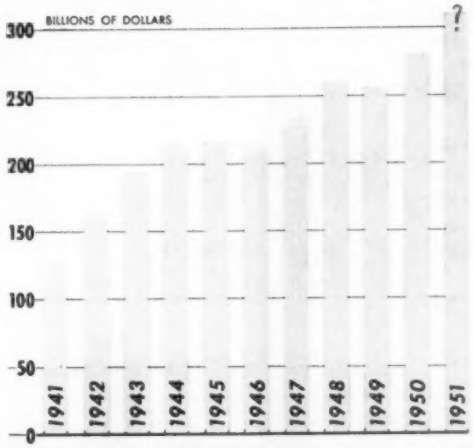
Keep in mind one other point. When only 10% of the gross national product is going for defense, it shows up as 20% or more on the Federal Reserve Index of Industrial Production. At the peak of the war effort in 1943, when 42% of the gross national product was devoted to war, it represented 70% of the Federal Reserve Index. The ratio is even bigger in durable goods.

Despite the speed-up of the defense program since mid-December, when President Truman declared a state of national emergency, production of munitions won't get going much before the middle of the year. After all, tooling of new lines takes time.

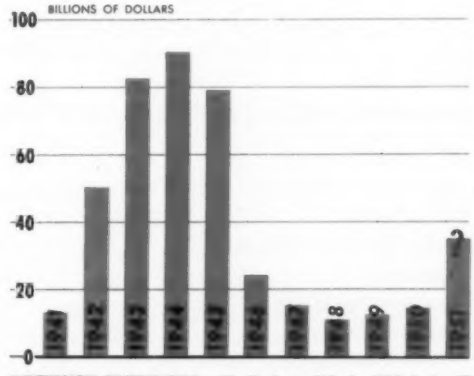
The conversion process inevitably will cause some confusion and dislocation. Plants will be shifting over from civilian to defense products. Workers will be flocking into factories making essential items. It will be increasingly hard for non-essential factories to keep their employees.

Many new plants are being built. Most are to be amortized quickly under "certificates of necessity." These speedy write-offs for tax purposes are proving to be good bait to induce manufacturers to expand facilities. Production equipment is included in the write-offs. The certificates are granted only in cases which aid defense.

Total spending for new plant and equipment will amount to $8.7 billion in U. S. manufacturing industries this year, according to a preliminary survey made by McGraw-Hill Department of Economics. The automobile industry will invest $925 million, machinery builders $640 million, electrical manufacturing companies $200 million, and transportation equipment companies (other than automobiles) $170 million. In every case, that is a sharp increase over 1950.



U.S. TOTAL PRODUCTION is nearing record peak of $300 billion and is headed still higher

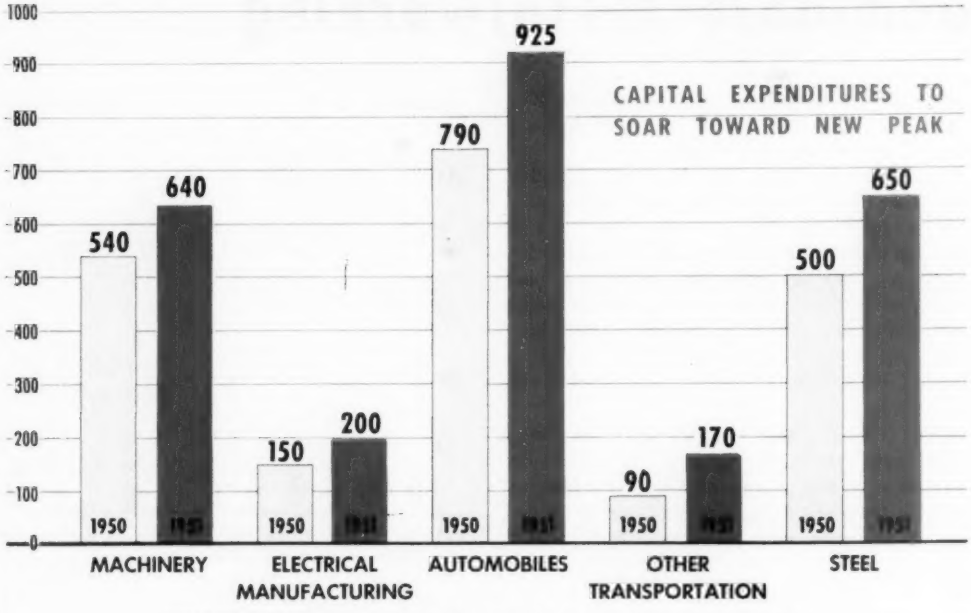


DEFENSE SPENDING will climb rapidly in 1951, but will still be far below level reached in World War II

Capital expenditures began to mount before the Korean war. Late in 1950 they had topped their 1948 postwar peak. Chances are that 1951 outlays will be much larger than the totals already indicated. New defense facilities will become necessary as the year rolls on.

Chief unknown factor in the situation is the failure of the armed services thus far to define clearly

DEFENSE PROGRAM TO DOMINATE METALWORKING . . . continued



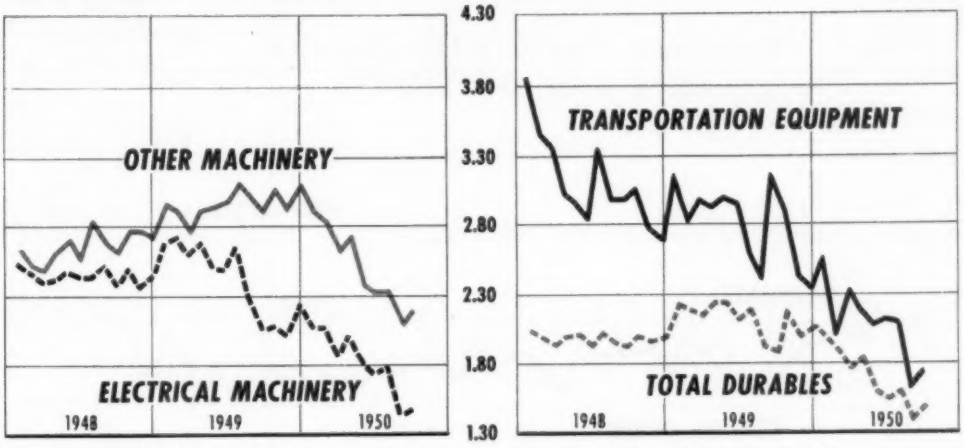
HEALTHY GAINS are assured in investments in new plants and equipment throughout the metalworking industries and in the steel industry this year

OUTLAY FOR NEW PLANTS AND EQUIPMENT TO RISE SHARPLY IN 1951

	(Millions of Dollars) SPENDING			PLANS	PERCENT CHANGE
	1948	1949	1950	1951	1950-1951
TOTAL MANUFACTURING	$ 8,160	$ 7,200	$ 7,330	$ 8,770	20%
Machinery	900	650	540	640	19
Electrical Machinery	310	220	150	200	33
Autos	630	570	790	925	17
Other Transportation Equipment	135	165	90	170	89
Steel	685	600	500	650	30
Chemicals	1,400	1,220	1,220	1,550	23
Petroleum Refining	740	720	675	775	15
Food	595	525	645	700	9
Other Manufacturing	2,765	2,530	2,720	3,210	18
RAILROADS	1,345	1,310	1,160	1,240	7
ELECTRIC & GAS UTILITIES	2,680	3,160	3,200	3,200	0
OTHER TRANSPORTATION AND COMMUNICATION	1,900	1,880	1,770	1,600	—10
Mining	765	750	660	775	17
GRAND TOTAL	$14,850	$14,300	$14,120	$15,585	10

Source: McGraw-Hill Dept. of Economics

METALWORKING INVENTORIES HAVE DROPPED STEADILY



RATIOS of inventories to sales in almost all segments of Metalworking are at new lows

the volume of defense weapons which they will need. When that is done, the feeling is that the defense production program will have to be revised upward.

Incidentally, defense needs cover not only U.S. armed services, but also "mutual aid" to western Europe. Such aid takes the form of actual weapons made here and shipped abroad, and of machinery sent over to help European countries make their own munitions.

The machinery building industries will be going full tilt during 1951. The machine tool industry, for one, has huge backlogs. This year it will at least double its 1950 dollar volume. Production equipment of all varieties—industrial furnaces, welding units, metal finishing units, mechanical-handling devices, presses, forging equipment—will be in heavy demand. There will be an insatiable market for such products as turbines, motors, bearings, electric controls, cutting tools, hand tools.

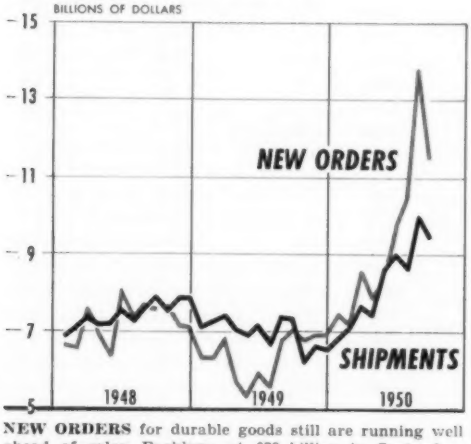
Materials will be sadly short. By midyear it seems apparent that the Controlled Materials Plan (CMP) of the last war will be back in some form. It will parcel out available tonnages on the basis of essentiality. Already, end uses of copper and of some other materials are being restricted. Much of the critical situation in materials springs from the government's stockpiling program. The monthly "set-asides" eat into supplies otherwise available to industry.

Washington's restrictions on use of materials, based on a percentage of consumption in the first half of 1950, are the immediate cause of lowered weekly work-hours and plant shutdowns.

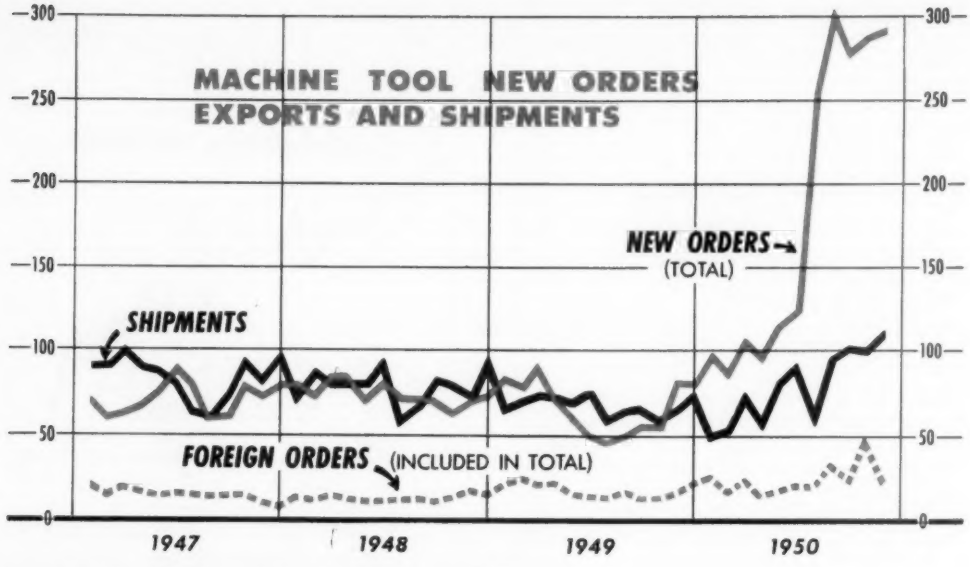
Manpower shortages are pinching, but are critical only in certain spots. The pinch will be tighter later in the year. The armed forces will take a minimum of 100,000 men a month from industry throughout 1951. On top of that, Metalworking must find many more workers than it now has in its ranks.

Metalworking will be in the midst of a major expansion period in 1951. It will use all the materials and manpower it can get. It will need more facilities than it recently has had to fill the demands upon it. It is going into the year at a pace never before attained except in World War II, and is sure to step up that pace as the year carries on.

ORDERS FOR DURABLE GOODS HAVE SPURTED SINCE MID-1949



NEW ORDERS for durable goods still are running well ahead of sales. Backlogs, at $28 billion in September, gained 55% in six months, are headed higher



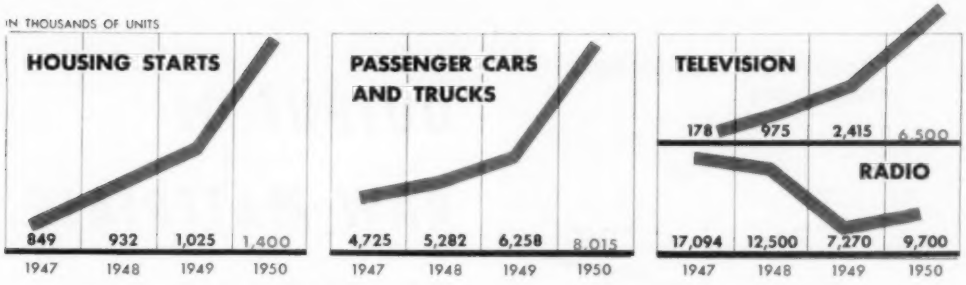
HUGE ORDERS INSURE FULL PRODUCTION OF MACHINE TOOLS

INDEX OF NEW ORDERS AND SHIPMENTS OF MACHINE TOOLS (Metal Cutting Types Only)

BASE—AVERAGE SHIPMENTS 1945-1946-1947 = 100%

		New Orders	Foreign Orders	Shipments
1950	Jan	99.7	26.7	52.8
	Feb	89.2	18.8	56.1
	Mar	107.4	24.9	75.3
	April	98.9	17.4	61.6
	May	116.4	18.4	82.5
	June	124.1	23.0	91.9
	July	253.1	22.3	68.3
	Aug	305.1	34.2	95.7
	Sept	280.6	27.2	101.6
	Oct	289.6	49.5	100.9
	Nov	p 292.7	p 26.6	p 110.9
	Dec			
1949	Jan	87.0	21.9	68.8
	Feb	80.9	26.5	70.3
	Mar	93.5	22.3	75.8
	April	70.1	23.1	74.7
	May	63.7	15.8	72.8
	June	53.6	15.7	79.0
	July	48.0	14.0	60.7
	Aug	51.5	18.8	67.3
	Sept	57.7	13.7	67.6
	Oct	56.8	13.7	62.3
	Nov	84.3	17.0	67.6
	Dec	82.5	22.4	75.7
1948	Jan	83.1	14.0	75.3
	Feb	77.3	12.7	87.1
	Mar	86.3	16.1	83.6
	April	86.3	14.1	82.0
	May	73.5	11.4	82.6
	June	83.4	11.9	94.4
	July	74.0	13.3	62.4
	Aug	73.7	13.6	69.8
	Sept	73.1	11.6	84.7
	Oct	67.4	14.0	80.4
	Nov	72.2	18.1	76.2
	Dec	76.7	16.2	96.9
1947	Jan	71.7	21.0	91.7
	Feb	63.8	15.8	92.4
	Mar	74.3	20.1	100.4
	April	69.8	18.8	93.3
	May	76.9	16.3	89.2
	June	90.9	17.2	84.1
	July	81.1	16.7	65.2
	Aug	62.1	14.6	63.6
	Sept	63.7	14.7	77.0
	Oct	81.0	16.0	94.8
	Nov	75.6	11.5	84.7
	Dec	81.1	14.8	98.4

Source: National Machine Tool Builders' Association *p: Preliminary figures*

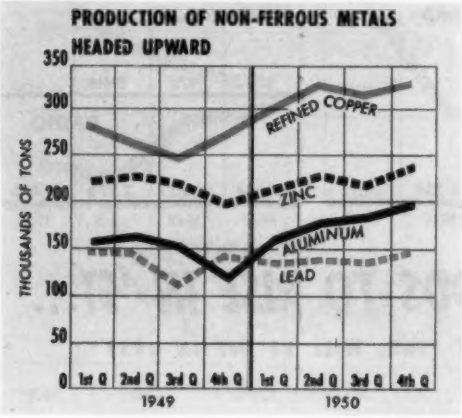


OUTPUT OF METAL GOODS TO RISE IN '51...

... BUT CIVILIAN GOODS OUTPUT, UP IN 1950, WILL BE OFF IN 1951

	1947	1948	1949	1950*
Housing Starts	849,000	931,600	1,025,100	1,400,000
Passenger Cars & Trucks (U. S.)	4,724,720	5,281,687	6,258,198	8,015,000
Truck Trailers	53,096	44,041	33,097	70,000
Television Sets	178,571	975,000	2,415,000	6,500,000
Home Radios	17,094,000	12,500,000	7,270,000	9,700,000
Washers	3,783,632	4,317,183	3,033,061	4,200,000
Ironers	599,258	476,276	307,345	400,000
Vacuum Cleaners	3,800,687	3,368,108	2,889,211	3,600,000
Electric Ranges	1,018,000	1,342,000	887,000	1,600,000
Domestic Cooking Stoves (Non-Electric)	3,467,240	3,531,582	2,441,223	3,250,000
Domestic Heating Stoves (Non-Electric)	6,334,958	5,125,733	3,655,936	4,000,000
Oil Burners	1,127,352	419,668	591,967	950,000
Warm Air Furnaces	850,783	776,548	717,201	1,000,000
Non-Electric Water Heaters	2,710,062	2,006,790	1,877,877	2,700,000
Refrigerators	3,400,000	4,766,000	4,450,000	6,000,000
Tractors	638,451	753,623	725,827	650,000
Freight Cars	68,507	112,634	95,172	42,500
Diesel Locomotive Units	1,430	2,661	1,785	2,775
Fractional Horsepower Motors	21,000,000	18,200,000	11,800,000	14,750,000
Industrial Electrical Trucks	4,131	3,442	2,601	2,650
Mechanical Stokers	68,908	85,460	34,961	30,000

DOLLAR VOLUME OF INDUSTRIAL PRODUCTS UP SHARPLY	(Thousands of Dollars) 1947	1948	1949	1950*
Blowers and fans (new orders)	$ 44,676	$ 49,992	$ 61,596	$ 90,000
Unit heater group (new orders)	30,922	36,080	36,269	45,000
Foundry equipment (new orders)	25,597	19,136	9,215	21,000
Industrial electric furnaces (new orders)	7,801	5,836	5,283	12,000
Pumps (new orders)	39,982	47,188	36,386	50,000
Polyphase induction motors (sales)	122,043	95,577	76,063	110,000
Direct current motors and generators (sales)	20,381	22,272	16,900	20,000
Electric flat irons (sales)	34,075	26,296	22,823	42,000
Tracklaying tractors (sales)	134,361	167,341	196,622	240,000
Power cranes and shovels (sales)	132,836	158,586	89,204	100,000
Road construction and maintenance machinery	97,272	117,908	96,816	110,000
Gear sales (index 1935-1939 = 100)	313.4	331.9	259.6	450.0
Screw machine products shipments (index 1940 = 100)	219	204	167	300



OUTPUT OF RAW MATERIALS TO EXPAND THIS YEAR

Output of raw materials was on a very high level during 1950. But this year production will spurt even higher.

Steel made a remarkable record last year. It turned out almost 100 million tons of ingots. Bringing in new capacity during 1951 will insure an even better record this year.

Much the same situation exists in aluminum as in steel. Idle productive facilities will be reopened and brand-new plants will come in. Altogether, 1951 promises to be a big year in this light metal.

It's much the same story all along the line. Metals producers are pushing their equipment to the full to get every ton possible out of it. One good reason why output will rise is that high prices are an inducement to marginal mines and plants to operate.

Fourth quarter of 1950 showed a marked gain in production of some materials. Take steel and aluminum castings, for example (see table). Or look at steel forgings. Or examine the slab zinc figures.

PRODUCTION OF RAW MATERIALS UP IN 1950, TO GO HIGHER IN 1951

	1949				1950			
	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q*
PIG IRON—(Thousands of Tons)	16,519	15,617	13,200	8,565	14,068	17,065	17,115	17,000
Basic "	12,809	12,113	10,500	6,330	10,827	13,264	13,349	13,000
Foundry "	887	706	615	580	623	651	1,422	1,400
STEEL "	24,052	21,873	19,084	12,879	22,210	24,897	24,600	26,000
REFINED COPPER "	284	267	251	274	303	330	317	335
LEAD "	149	148	115	144	138	142	139	150
SLAB ZINC "	223	227	219	201	218	231	222	240
ALUMINUM "	158	165	158	123	161	180	186	190
CASTINGS (Thousands of Short Tons)								
Steel	417	344	255	233	294	356	361	400
Gray Iron	3,102	2,701	2,450	2,297	2,773	3,212	2,163	3,300
Malleable	211	176	163	164	190	228	236	255
Copper & Copper Base Alloy	108	82	80	92	107	117	130	145
Zinc & Zinc Base Alloy	45	43	49	51	57	68	70	75
Aluminum & Aluminum Base Alloy	42	34	35	41	47	54	56	63
STEEL FORGINGS (Thousands of Tons)	356	297	254	233	294	330	341	365

* *Estimated*

Source: U. S. Bureau of Mines, American Iron and Steel Institute, U. S. Dept. of Commerce

METALWORKING EXPORTS DOWN IN 1950

	(MILLIONS OF DOLLARS) First 8 Months 1949	1950	Percent Change of Monthly Averages 1949-1950
TOTAL MACHINERY AND VEHICLES	3,561.4*	2,037.6	—14.2
ELECTRICAL MACHINERY AND APPARATUS*	490.6	258.0	—21.1
Generators	57.0	27.5	—27.5
Electrical distribution equipment	80.6	48.2	—10.3
Motor starters and controllers	41.4	26.9	— 2.4
Electric refrigerators and appliances	96.8	62.1	— 3.7
Signal and communication devices*	71.8	44.0	— 8.1
ENGINES, TURBINES AND PARTS	196.6	103.1	—21.3
Steam engines, boilers and accessories	42.8	14.9	—47.7
Internal combustion engines	112.7	67.9	— 9.6
Steam locomotives and parts	36.2	17.1	—29.0
CONSTRUCTION AND CONVEYING MACHINERY	221.1	116.3	—21.1
MINING, WELL AND PUMPING MACHINERY	187.8	90.0	—38.9
Mining and quarry machinery	60.4	32.1	—20.2
Well and refining machinery	84.4	37.3	—33.6
Pumping machinery	43.0	20.9	—27.0
METALWORKING MACHINERY	196.5	130.1	— 0.7
Machine tools	90.5	49.3	—18.2
Lathes	17.7	10.5	—10.7
Milling and gear cutting machinery	29.1	18.3	— 5.5
Planers and shapers	2.7	1.1	—37.0
Grinding machinery	15.7	10.3	— 1.3
Machine tool parts and equipment	25.4	9.3	—44.9
OTHER METALWORKING MACHINERY	97.5	66.6	+ 2.5
Sheet and plate metalworking machinery	22.2	13.1	—11.3
Forging machinery and parts	7.5	5.6	+12.0
Rolling mill machinery and parts	54.9	46.9	+28.2
Foundry equipment and parts	4.5	2.2	—26.7
Hand tools	8.5	4.1	—25.9
TEXTILE, SEWING, AND SHOE MACHINERY	156.2	84.5	—18.8
OTHER INDUSTRIAL MACHINERY	361.7	184.5	—23.5
OFFICE APPLIANCES	84.0	52.8	— 5.7
PRINTING AND BOOK BINDING MACHINERY	44.9	23.8	—20.5
AGRICULTURAL MACHINERY, OTHER THAN TRACTORS	128.4	77.4	— 9.6
TRACTORS*	293.3	171.3	—12.4
AUTOMOBILE PARTS AND ACCESSORIES	750.5	445.1	—11.0
Motor trucks, buses and chassis	228.2	134.7	—11.4
Passenger cars and chassis	205.1	106.7	—21.9
Secondhand autos, trucks and buses	10.3	6.0	—12.6
AIRCRAFT PARTS AND ACCESSORIES*	112.8	70.5	— 6.2
OTHER VEHICLES AND PARTS	229.0	113.8	—25.5
Merchant vessels	173.2	93.3	—19.2
Freight cars	17.9	5.7	—52.0
SPECIAL CATEGORY ITEMS	128.4	121.1	+41.5

*Some items are omitted for national security reasons and grouped in one special category classification. SOURCE: Bureau of Foreign and Domestic Commerce

Large Export Volume Expected

Imports topped exports in 1950 for first time in over ten years. That gives other countries more dollars with which to buy U.S. goods. But in 1951 limiting factor in export sales will be amount of goods available.

Prospects are bright, nevertheless, for continuing large volume of metalworking exports. Rearmament program will force major changes in types of equipment going abroad, and where they go. ECA and $6.5 billion military-aid for western Europe will stimulate shipments of all kinds of metalworking equipment.

WAGE AND PRICE INCREASES THIS YEAR

WAGES and prices, which rose sharply after the Korean war began, are still headed upward. Prospects are for continuing increases, even if controls come as the defense program unfolds. Gains this year, however, are likely to be smaller than in 1950.

Wholesale prices jumped faster than wages (see chart) from September, 1949, to September, 1950. Average hourly wages in key metalworking industries, on the other hand, went up more than did the consumers' price index. Farm machinery was the exception; strikes in that industry pulled down the wage figure last September.

Truth is that the chart on this page does not show fully what has happened to wages and prices since the Korean action started. Take-home pay is up much more than hourly wages indicate. Reason: working hours have risen spectacularly. Many workers once again are putting in overtime on a steady basis.

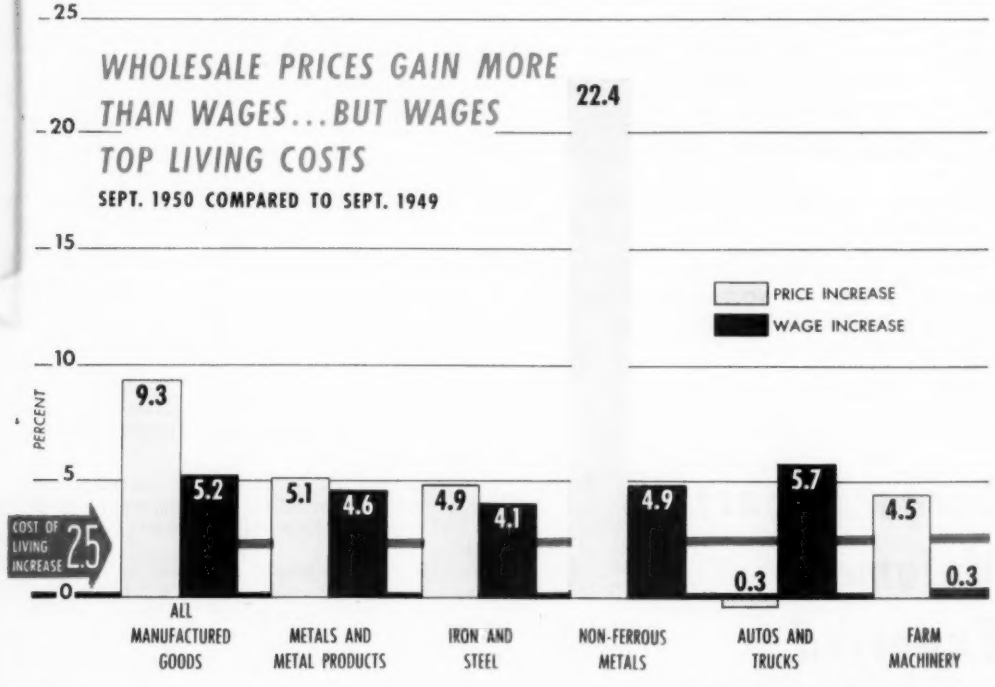
Then, figures on wage rates don't reflect the cost of "fringe benefits"— insurance, pensions, holidays, and other employee plans which comprise a healthy share of today's labor costs.

Advances in hourly wages were up substantially last year from 1949. The gain was 5.2%, compared with only 1.5% the previous year.

Biggest hike in hourly wages was in iron and steel forgings (10.7%). Competing for second place were machine tool builders and gray iron foundries (9.5% each). Metalworking machinery (other than machine tools) and hand tools were high on the list (with 8.6% and 8.3% respectively).

No existing index fully reflects price changes in the metalworking industries. But prices of manufactured goods in general went up 9.3% in the past year. The bulk of the increase came after the Korean invasion. From hand tools to automobiles, prices of metal products have risen as wages and other costs soared.

Remember this: controls slowed price and wage advances during World War II. But they did not freeze all movement. There is no reason to believe that they will this time.



LIKELY TO BE SMALLER THAN IN 1950

HOURLY WAGES CONTINUE UPTREND

	SEPT. 1948	SEPT. 1949	SEPT. 1950	Percent Increase Sept. 1949 Sept. 1950
ALL MANUFACTURING INDUSTRIES	$1.386	$1.407	$1.480	5.2
Durable Goods	1.457	1.482	1.560	5.3
Non-Durable Goods	1.304	1.328	1.382	4.0
Steel Mills	1.675	1.673	1.730	3.4
Gray Iron Foundries	1.446	1.456	1.594	9.5
Malleable Iron Foundries	1.518	1.543	1.611	4.4
Steel Foundries	1.533	1.526	1.593	4.4
Iron & Steel Forgings	1.664	1.652	1.829	10.7
Wire Drawing	1.613	1.624	1.746	7.5
Tin Cans & Other Tinware	1.404	1.432	1.487	3.8
Cutlery & Edge Tools	1.254	1.281	1.355	5.8
Hand Tools	1.409	1.416	1.534	8.3
Hardware	1.401	1.440	1.530	6.3
Oil Burners, Non-Electric Heating & Cooking Apparatus	1.431	1.443	1.515	5.0
Structural Steel & Ornamental Metalwork	1.439	1.487	1.542	3.7
Boiler Shop Products	1.482	1.499	1.549	3.3
Sheetmetal Work	1.441	1.458	1.529	4.9
Stamped & Pressed Metal Products	1.494	1.556	1.638	5.3
Machinery Except Electrical	1.512	1.538	1.627	5.8
Engines & Turbines	1.616	1.625	1.727	6.3
Tractors	1.588	1.590	1.602	0.8
Agricultural Machinery Except Tractors	1.491	1.545	1.538	—0.5
Construction & Mining Machinery	1.477	1.472	1.577	7.1
Machine Tools	1.485	1.512	1.656	9.5
Metalworking Machinery Except Machine Tools	1.541	1.545	1.678	8.6
Machine Tool Accessories	1.608	1.640	1.705	4.0
Special Industrial Machinery	1.471	1.515	1.588	4.8
General Industrial Machinery	1.492	1.509	1.615	7.0
Computing Machines & Cash Registers	1.652	1.711	1.791	4.7
Typewriters	1.354	1.440	1.535	6.6
Service Industry & Household Machines	1.519	1.550	1.646	6.2
Refrigerators & Air-Conditioning Units	1.519	1.576	1.641	4.1
Electrical Machinery	1.435	1.447	1.496	3.4
Communication Equipment	1.348	1.361	1.373	0.9
Radios, Phonographs, Television Sets & Equipment	1.272	1.287	1.329	3.3
Automobiles	1.678	1.716	1.814	5.7
Aircraft	1.500	1.541	1.641	6.5
Aircraft Engines & Parts	1.603	1.603	1.695	5.7
Ship & Boat Building & Repairing	1.609	1.618	1.657	2.4
Locomotives & Parts	1.603	1.665	1.761	5.8
Railroad & Street Cars	1.559	1.588	1.619	2.0

Source: Bureau of Labor Statistics

STEEL SHIPMENTS TO CONSUMERS EXPECTED TO SHIFT IN 1951

	NET TONS		RELATIVE IMPORTANCE		WHERE MAJOR SHIFTS WILL TAKE PLACE IN 1951
	1949	9 MONTHS 1950	IN 1949	IN 1950	
1. Steel for Converting & Processing	2,504,168	2,635,377	4.4%	5.1%	
2. Forgings (Other than Automotive)	821,570	769,448	1.5	1.5	
3. Bolts, Nuts, Rivets & Screws	874,594	1,048,201	1.6	2.0	
4. Jobbers	10,219,983	9,851,113	18.1	19.0	
Oil & Gas Industry	1,336,948	1,259,882	2.4	2.4	
All Others	8,883,035	8,591,231	15.7	16.6	
5. Construction including Maintenance	7,477,953	6,250,236	13.2	12.1	▼
6. Contractors Products	2,124,806	2,279,771	3.8	4.4	
7. Automotive	10,962,894	10,723,441	19.4	20.7	▼
Passenger Cars, Trucks, Parts, etc.	10,638,940	10,319,044	18.8	19.9	
Forgings	323,954	404,397	0.6	0.8	
8. Rail Transportation	3,655,406	3,113,749	6.4	6.0	▲
Railroad Rails, Trackwork & Equipment	1,829,525	1,748,620	3.2	3.4	
Freightcars, Passenger Cars & Locomotives	1,774,875	1,328,343	3.1	2.5	
Street Railways & Rapid Transit Systems	51,006	36,786	0.1	0.1	
9. Shipbuilding & Marine Equipment	668,694	224,011	1.2	0.4	▲
10. Aircraft	41,096	30,293	0.1	0.1	▲
11. Oil & Gas Drilling	600,205	442,627	1.1	0.9	
12. Mining, Quarrying & Lumbering	271,872	196,990	0.5	0.4	
13. Agricultural	1,491,085	1,164,632	2.7	2.3	
Agricultural Machinery	1,218,563	982,959	2.2	1.9	
All Other Agricultural	272,522	181,673	0.5	0.4	
14. Machinery, Industrial Equipment & Tools	2,708,633	2,549,410	4.8	4.9	▲
15. Electrical Machinery & Equipment	1,209,027	1,282,686	2.1	2.5	▲
16. Appliances, Utensils & Cutlery	1,322,922	1,544,104	2.3	3.0	▼
17. Other Domestic & Commercial Equipment	1,325,940	1,309,863	2.3	2.5	▼
18. Containers	4,655,635	4,387,897	8.2	8.5	▼
19. Ordnance & Other Military	81,150	90,790	0.1	0.2	▲
20. Export	3,517,971	1,835,938	6.2	3.5	
21. Unclassified	1,568,406	973,084	—	—	
GRAND TOTAL	**58,104,010**	**52,703,661**			
		71,500,000 (12 Mos. Total Estimate)			

Source: American Iron & Steel Institute

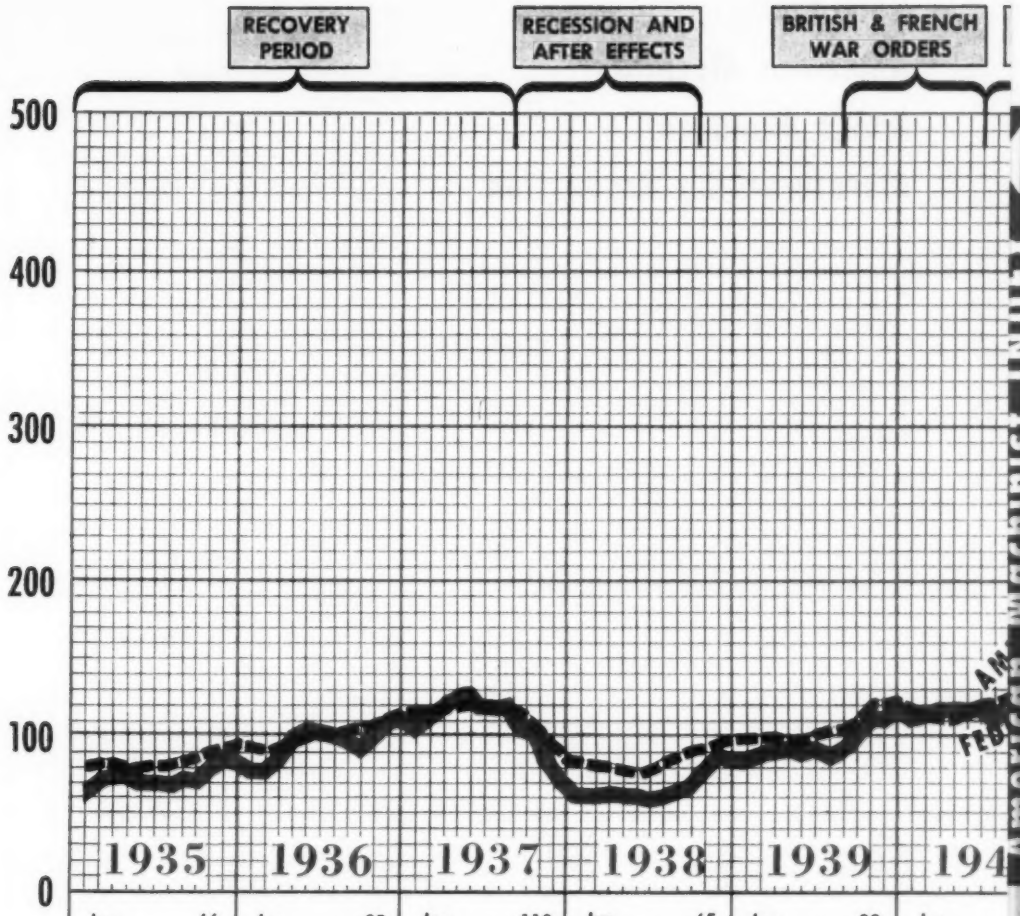
DEFENSE PROGRAM WILL BRING MAJOR CHANGE IN STEEL USAGE

Armament requirements will bring a sharp shift in steel consumption in 1951. Just as much steel will be produced this year as last, when finished steel output was about 71.5 million tons. But the channeling of the steel into different segments of Metalworking will be far different.

Automobile industry, leading user in 1949 and 1950, will take less tonnage for car production because less will be available for that purpose. Construction projects of all kinds will not get as much steel. Appliance makers, container companies and manufacturers of domestic and commercial equipment will use less steel. Washington won't let them have as much.

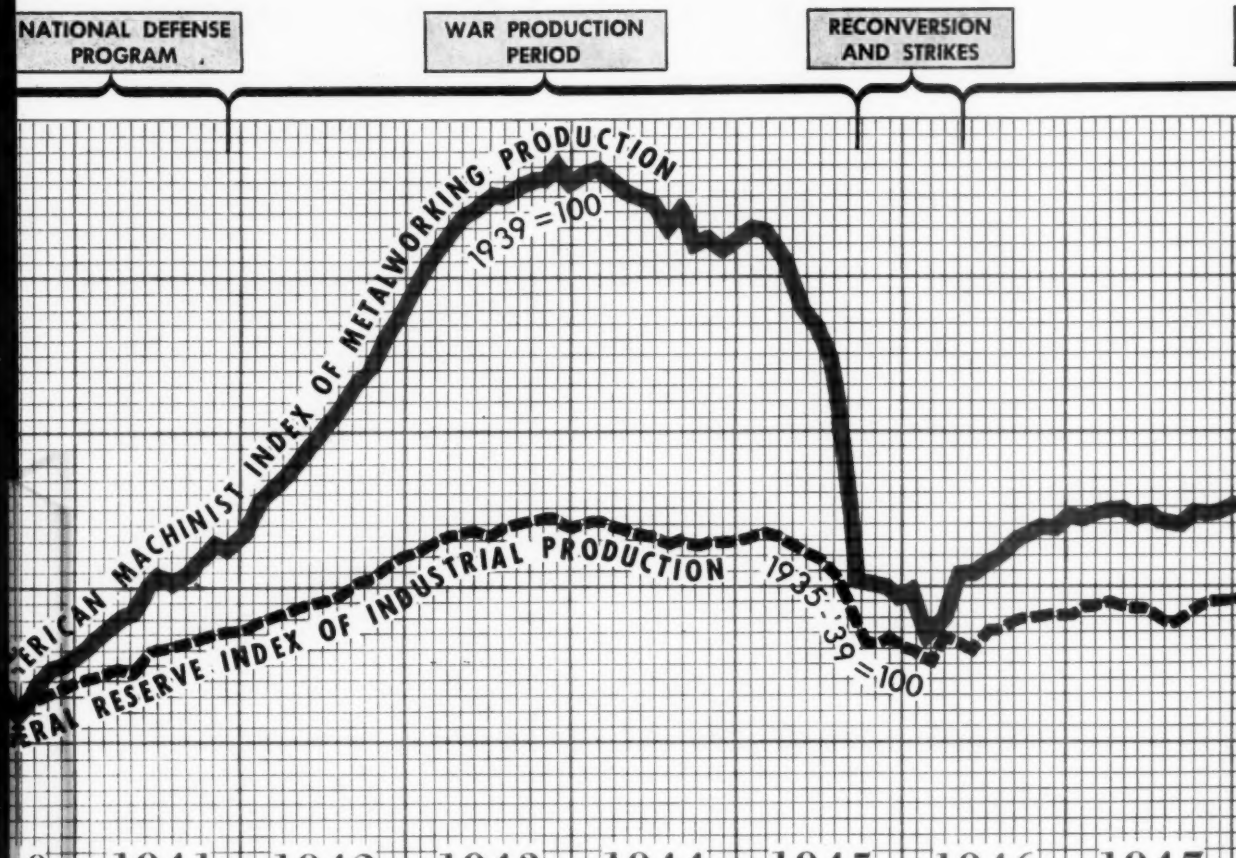
Industries which are tied directly or indirectly to defense will increase substantially their consumption of steel. Makers of ordnance and other military equipment will benefit, for one. Aircraft and shipbuilding will be looking up as steel consumers, for another. Industrial machinery builders and companies fabricating electrical machinery and equipment will account for a higher ratio of steel consumption than at any time since World War II. Rail transportation equipment companies also are being allotted specially large tonnages of steel to meet programs regarded as essential to speeding of the defense program.

No one knows exactly how much steel will go into armament manufacture the coming year. But it is likely to be a minimum of 20% over-all. In certain lines, such as plates, it will be very high. That goes for alloy steels too.



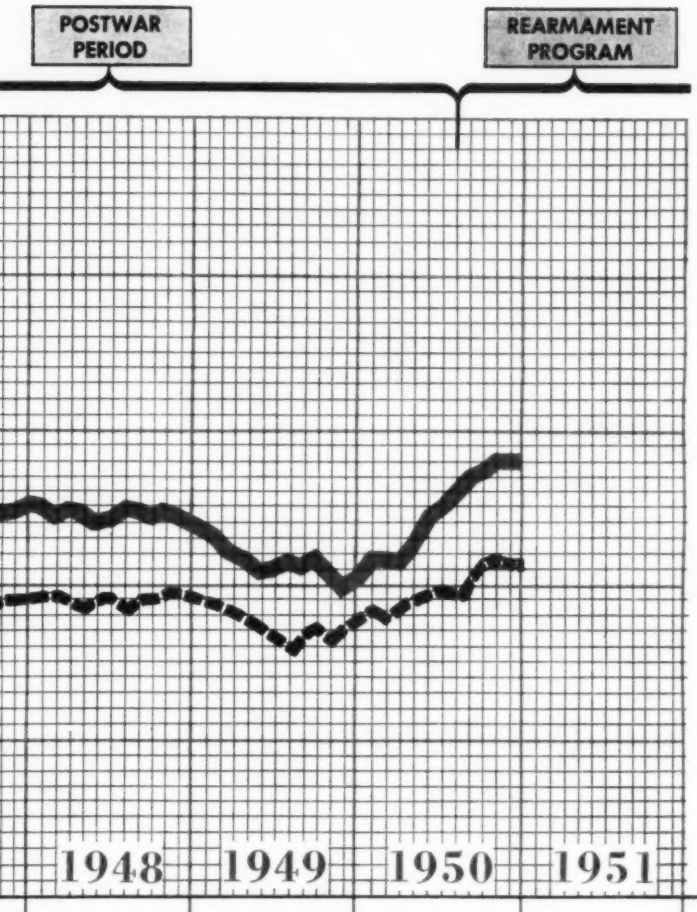
1935		1936		1937		1938		1939		194	
Jan.	66	Jan.	82	Jan.	110	Jan.	65	Jan.	89	Jan.	
Feb.	74	Feb.	81	Feb.	114	Feb.	65	Feb.	92	Feb.	
Mar.	77	Mar.	90	Mar.	122	Mar.	67	Mar.	94	Mar.	
Apr.	78	Apr.	101	Apr.	128	Apr.	66	Apr.	95	Apr.	
May	74	May	106	May	131	May	65	May	93	May	
June	73	June	105	June	121	June	61	June	96	June	
July	72	July	102	July	120	July	64	July	90	July	
Aug.	75	Aug.	101	Aug.	122	Aug.	68	Aug.	95	Aug.	
Sept.	74	Sept.	97	Sept.	108	Sept.	72	Sept.	105	Sept.	
Oct.	83	Oct.	105	Oct.	105	Oct.	83	Oct.	115	Oct.	
Nov.	89	Nov.	112	Nov.	88	Nov.	91	Nov.	115	Nov.	
Dec.	88	Dec.	114	Dec.	73	Dec.	89	Dec.	121	Dec.	

American Machinist



.0	1941	1942	1943	1944	1945	1946	1947
..117	Jan. 165	Jan. 256	Jan. 408	Jan. 470	Jan. 432	Jan. 204	Jan. 248
..119	Feb. 176	Feb. 265	Feb. 420	Feb. 472	Feb. 431	Feb. 172	Feb. 250
..121	Mar. 184	Mar. 276	Mar. 431	Mar. 467	Mar. 422	Mar. 185	Mar. 252
..121	Apr. 187	Apr. 286	Apr. 441	Apr. 459	Apr. 410	Apr. 211	Apr. 253
.120	May 202	May 296	May 446	May 452	May 385	May 212	May 249
.121	June 212	June 308	June 453	June 450	June 373	June 219	June 252
.116	July 209	July 319	July 452	July 434	July 350	July 223	July 247
.125	Aug. 213	Aug. 336	Aug. 460	Aug. 448	Aug. 298	Aug. 234	Aug. 244
.139	Sept. 223	Sept. 342	Sept. 462	Sept. 425	Sept. 208	Sept. 238	Sept. 250
.150	Oct. 233	Oct. 364	Oct. 464	Oct. 428	Oct. 207	Oct. 242	Oct. 250
.153	Nov. 230	Nov. 378	Nov. 478	Nov. 420	Nov. 204	Nov. 242	Nov. 251
.160	Dec. 237	Dec. 392	Dec. 466	Dec. 426	Dec. 198	Dec. 249	Dec. 257

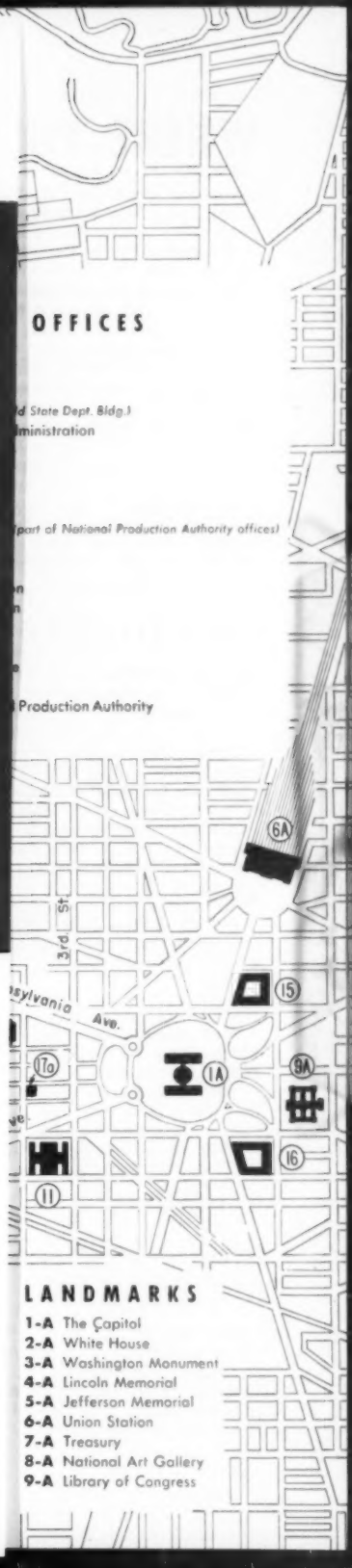
INDEX OF METALWORKING P



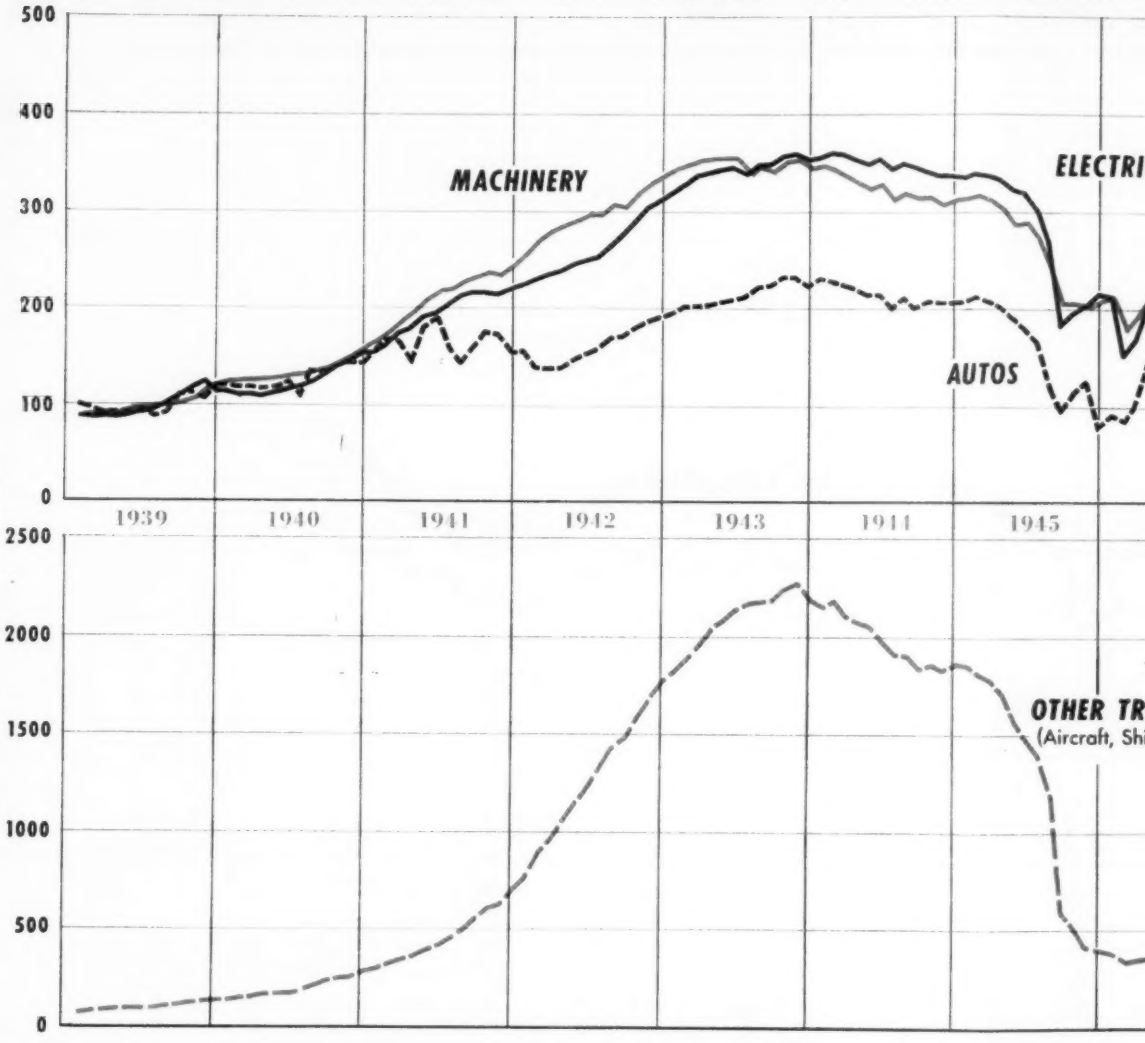
American Machinist INDEX

1948		1949		1950		1951	
8	Jan. 255	Jan. 240		Jan. 221		Jan.	
0	Feb. 249	Feb. 236		Feb. 221		Feb.	
2	Mar. 252	Mar. 227		Mar. 220		Mar.	
3	Apr. 250	Apr. 222		Apr. 231		Apr.	
9	May 245	May 215		May 248		May	
2	June 247	June 216		June 255		June	
7	July 253	July 220		July 266		July	
4	Aug. 252	Aug. 218		Aug. 274		Aug.	
0	Sept. 248	Sept. 222		Sept. 279		Sept	
0	Oct. 250	Oct. 214		Oct. 285		Oct.	
1	Nov. 249	Nov. 204		Nov. 285		Nov.	
7	Dec. 245	Dec. 210		Dec. 285		Dec.	

PRODUCTION



WHAT'S HAPPENED TO FOUR OF THE FIVE



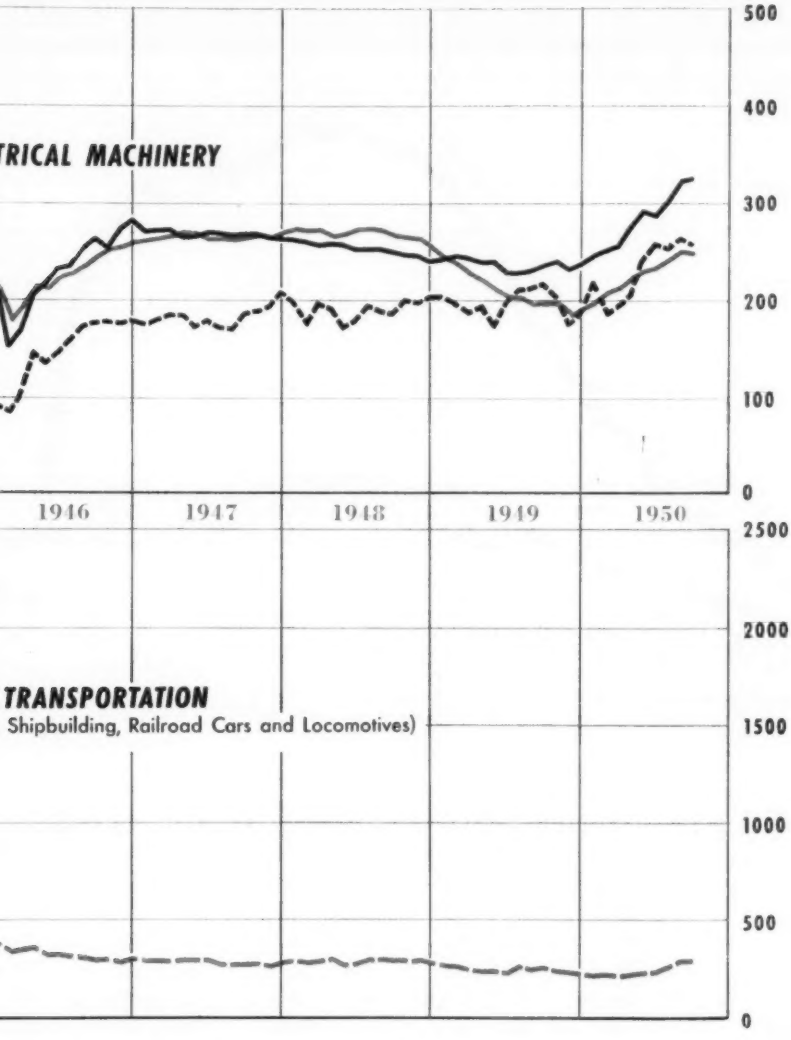
MACHINERY

	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950
Jan.	88	124	166	259	343	347	314	213	263	273	245	199
Feb.	91	123	175	270	347	342	317	182	264	271	239	208
Mar.	93	124	184	280	351	337	312	195	265	272	230	213
Apr.	93	125	196	284	353	330	304	212	270	267	220	223
May	95	125	208	290	353	325	289	214	268	269	211	230
June	96	128	217	298	353	329	291	225	265	272	204	234
July	99	129	219	298	342	316	276	227	264	273	203	244
Aug.	101	133	226	308	345	320	244	238	263	272	199	251
Sept.	103	137	230	305	341	313	205	245	265	267	199	249
Oct.	107	143	235	322	350	315	204	252	265	265	199	261
Nov.	115	148	233	329	351	308	203	254	265	263	187	266
Dec.	119	160	246	337	344	313	210	260	269	258	194	270

ELECTRICAL MAC

	1939	1940	1941	1942	1943	1944
Jan.	88	116	154	225	322	356
Feb.	86	110	163	230	329	360
Mar.	88	110	173	236	339	358
Apr.	87	109	179	239	340	351
May	89	112	191	144	342	348
June	94	116	195	245	343	352
July	98	118	202	252	341	342
Aug.	103	125	212	266	345	346
Sept.	109	133	215	275	346	344
Oct.	117	140	215	282	354	340
Nov.	122	144	214	306	359	335
Dec.	117	153	221	316	351	336

COMPONENTS OF THE INDEX

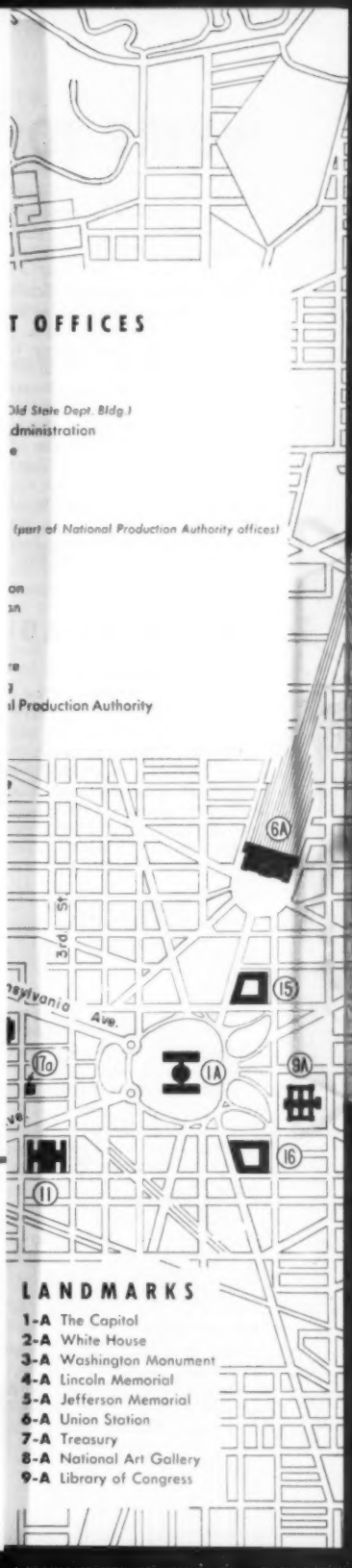


ACHINERY

1944	1945	1946	1947	1948	1949	1950
356	335	212	271	264	245	246
360	338	151	271	262	246	252
358	337	168	273	258	244	258
351	332	208	268	260	240	278
348	323	216	268	258	240	292
352	320	230	269	255	229	289
342	303	233	268	255	228	303
346	266	251	264	256	229	321
344	184	263	266	252	237	323
340	197	252	266	249	241	333
335	204	275	264	247	233	333
336	213	284	265	241	238	333

AUTOMOBILES

	1939	1940	1941	1942	1943	1944	1945	1946
Jan.	100	121	155	158	197	232	206	92
Feb.	95	119	168	140	202	227	212	85
Mar.	92	119	167	139	202	223	207	101
Apr.	93	115	147	140	203	220	202	148
May	92	117	182	148	206	212	189	138
June	96	122	193	154	209	213	182	148
July	89	110	162	160	212	200	165	161
Aug.	93	134	145	170	221	210	120	174
Sept.	109	136	162	172	222	201	99	179
Oct.	114	141	178	180	234	205	114	179
Nov.	108	143	176	187	233	203	128	177
Dec.	119	143	154	192	222	205	82	180



How the American Machinist Index Measures Metalworking Production

The AMERICAN MACHINIST index measures the physical volume of production in all industries engaged in fabrication of metal products. The accompanying table lists the industries covered.

The U.S. Bureau of Labor Statistics compiles monthly figures on production workers employed and average weekly hours worked in these industries. Multiplying these two factors together gives a measure of the number of manhours worked in each industry.

AMERICAN MACHINIST groups manhours worked in each industry into five principal branches of metalworking: (1) Machinery; (2) Electrical Manufacturing; (3) Automobiles and Trucks; (4) Other Transportation Equipment; and (5) Other Metalworking.

The figures are then adjusted for seasonal variations. The seasonally adjusted manhour figures are then converted into indexes based on 1939 as 100.

Finally, the index figures for each of the five major groups are adjusted for changes in productivity, derived from studies of long-term trends in productivity as reported by the Bureau of Labor Statistics.

To combine output in these various industries into one index, allowance is made for the relative importance of each of the five divisions of Metalworking. The AMERICAN MACHINIST index is self-weighted, since the manhours worked are used as weights. The weights change as each industry's relative importance to Metalworking as a whole changes.

Here is how the major segments of Metalworking lined up in 1950 under this method of weighting: Machinery 28.4%; Electrical Manufacturing 17.2%; Autos and Trucks 19.8%; Other Transportation Equipment 8.7%; and Other Metalworking 25.9%.

To determine where the Index stands each month, AMERICAN MACHINIST uses the same procedure as is used in figuring out the components. The seasonally adjusted figures for the five groups are totaled. The total is converted to an index based on 1939 as 100. This figure is then adjusted for the average change in productivity in the five major branches. The result is the AMERICAN MACHINIST index.

METALWORKING INDUSTRIES COVERED BY INDEX

MACHINERY

Engines and turbines
Tractors
Agricultural machinery (except tractors)
Construction and mining machinery
Machine tools
Metalworking machinery (except machine tools)
Machine tool accessories
Special-industry machinery (except metalworking machinery)
General industrial machinery
Computing machines and cash registers
Typewriters
Service-industry and household machines
Miscellaneous machinery parts

ELECTRICAL MACHINERY

Electrical generating transmission, distribution, and industrial apparatus
Electrical equipment for vehicles
Radios, phonographs, television sets and equipment
Telephone and telegraph equipment
Electrical appliances, lamps, and miscellaneous products

AUTOMOBILES
OTHER TRANSPORTATION EQUIPMENT

Aircraft
Aircraft engines and parts
Aircraft propellers and parts
Other aircraft parts and equipment
Shipbuilding and repairing
Boat building and repairing
Locomotives and parts
Railroad and streetcars
Other transportation equipment

OTHER METALWORKING

Tin cans and other tinware
Cutlery and edge tools
Hand tools
Hardware
Sanitary ware and plumbers' supplies
Oil burners, nonelectric heating and cooking apparatus, not elsewhere classified
Structural steel and ornamental metal work
Boiler-shop products
Sheet-metal work
Metal stamping, coating and engraving
Other fabricated metal products
Ophthalmic goods
Photographic apparatus
Watches and clocks
Professional and scientific instruments

OTHER TRANSPORTATION EQUIPMENT

1947	1948	1949	1950
179	199	203	218
184	177	197	188
188	195	187	195
187	191	193	205
173	173	173	241
184	180	198	260
177	195	209	254
174	189	210	264
189	187	216	258
190	199	203	264
195	198	176	258
208	203	185	255

	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950
Jan.	75	139	299	780	1825	2158	1858	387	288	281	261	208
Feb.	80	141	321	907	1895	2194	1813	340	287	275	259	214
Mar.	82	151	341	980	1970	2103	1777	340	285	279	252	210
Apr.	85	153	361	1075	2052	2071	1693	356	294	281	243	212
May	92	158	396	1152	2085	2051	1563	330	292	268	244	221
June	95	165	433	1236	2132	1985	1463	323	291	269	242	225
July	99	183	468	1334	2163	1921	1380	316	274	285	260	250
Aug.	104	211	500	1437	2178	1912	1173	310	273	287	238	279
Sept.	109	229	552	1498	2195	1842	605	292	272	286	248	288
Oct.	121	240	610	1592	2241	1868	513	299	272	286	231	273
Nov.	127	248	630	1689	2264	1834	422	289	271	285	229	277
Dec.	131	279	708	1773	2186	1865	402	309	281	279	216	280

METALWORKING GUIDE TO DEFENSE BUSINESS

AMERICAN MACHINIST SPECIAL REPORT

GOVERNMENT OFFICES

1 State Dept. Bldg.
2 Federal Reserve Board
3 Department of Interior
4 Executive Office Bldg. *(Old State Dept. Bldg.)*
5 Economic Cooperation Administration
6 Department of Commerce
7 Department of Labor
8 Internal Revenue Bureau
9 Department of Justice
10 Temporary "T" Building *(part of National Production Authority offices)*
11 Social Security Bldg.
12 Navy Building
13 Atomic Energy Commission
14 Federal Trade Commission
15 Senate Office Building
16 House Office Building
17 Department of Agriculture
17a Temporary "E" Building
17b Future Home of National Production Authority

HOTELS

18 Statler Hotel
19 Carlton Hotel
20 Mayflower Hotel
21 Hay-Adams Hotel
22 Washington Hotel
23 Willard Hotel
24 Raleigh Hotel
25 Ambassador Hotel

LANDMARKS

1-A The Capitol
2-A White House
3-A Washington Monument
4-A Lincoln Memorial
5-A Jefferson Memorial
6-A Union Station
7-A Treasury
8-A National Art Gallery
9-A Library of Congress

January 22, 1951

WHERE TO GO FOR GOVERNMENT HELP

IF YOU HAVE a question about mobilization, and want a starting point to track down an answer, this guide is designed to help you find that starting point.

One piece of advice which sounds simple, but needs saying at the outset: Before you write, wire, phone, or visit Washington, check first to see if you can't get a good steer from local or regional government offices. If you aren't sure there is one, try the nearest Department of Commerce office (page 152) or your local Chamber of Commerce.

For some parts of the mobilization program, we can bring you closer to the right man than we can for other parts. We can't tell you who is going to handle price controls on machine tools, for instance; but neither can Michael DiSalle, the Price Administrator. Reason: The man hasn't been named yet. On the other hand, we can tell you the man who is handling stainless steel, or cobalt, or oil field machinery at the National Production Authority. There are specialists already assigned to these items.

Names, phone extensions and room numbers given here may change, organizationwise, as time goes on. But, by and large, the people and offices listed here will be dealing with the same problems, even though organizations may change.

(Note: All Washington agencies should be addressed at "Washington 25, D.C.")

TOP POLICY AGENCIES

Over-all Control

Charles E. Wilson, Office of Defense Mobilization. Executive office building. Phone Executive 3300, ext. 2102. Mr. Wilson plans to have a small policy-making staff in his ODM. His authority covers all mobilization aspects of all departments and agencies, including prices and wages, Dept. of Defense, Dept. of State, Dept. of Labor etc.

Prices

Michael DiSalle, chief, Price Division, Economic Stabilization Agency. Sterling 4200, ext. 3215. Temporary E Bldg.

Wages

Wage Stabilization Board. Cyrus Ching, chairman. Sterling 4200, ext. 2231. Temporary E.

Industry members—Henry B. Arthur, Swift & Co., Chicago; J. Ward Keener, B. F. Goodrich Co., Akron; Reuben Robertson, Jr., Champion Paper & Fiber Co., Hamilton, Ohio.

Hiring Workers

First see nearest State Employment Office. In Washington: Robert C. Goodwin, U. S. Employment Service, Department of Labor. Executive 2420, ext. 780.

Labor Rates

On government contracts. Verl E. Roberts, chief, Division of Wage Determinations, Wage-Hour Administration, Dept. of Labor Bldg. Executive 2420, ext. 1294.

Labor Disputes

Nearest regional office, U. S. Conciliation Service. In Washington: U. S. Conciliation Service, Department of Labor. Executive 7350, ext. 4.

Loans and Tax Amortization

Applications go first to National Security Resources Board, are returned there for final approval. Reorganization may put this authority in either ODM, or NPA.

At NSRB, Byron D. Woodside, Office of Business Expansion. Sterling 4700, ext. 3436.

At NPA, Frank R. Creedon, Facilities and Construction Bureau. Sterling 9200, ext. 4659, room 3827, Commerce Bldg.

Procurement

First and best place to go—Nearest procurement office, any branch of the armed services if you are in doubt. Or, nearest office of the branch of the service you have been doing business with.

Washington procurement information—First try Central Procurement Information Office, Department of Defense. Liberty 5-6700, ext. 75321.

Small business procurement — Munitions Board has active small business group handling special problems. Write Munitions Board, Department of Defense. Liberty 5-6700, ext. 71481.

Small business committees, Senate and House—Both are active, and can be effective. Both in the Capitol. National 3120.

Bids, contracts—Department of Commerce field offices, local Chambers of Commerce, and other organizations get daily list of bids asked, contracts let by procurement offices of all services. List isn't complete, but may be helpful.

Defense Production Administration

Administrator—William H. Harrison. Sterling 9200, ext. 4423, room 5800, Department of Commerce.

Under Mr. Wilson, DPA is the top agency which directs operation of the other controls agencies with exception of Economic Stabilization, Prices, and Wages.

In a matter of time, you can expect DPA to take unto itself the operating agencies still housed in Commerce, Interior, and other old-line government departments. Even now, however, the line of authority from Mr. Wilson through Mr. Harrison to the control agencies is direct. The cabinet officers who formerly reported to Mr. Symington of NSRB are now only advisory to Mr. Wilson, as members of his Defense Mobilization Board. Their mobilization bureaus are now under Mr. Wilson and Mr. Harrison.

DPA's authority and responsibility: "Establish overall production priorities; determine program feasibility; set production program goals; determine scope of production expansion; estimate labor requirements for production programs; secure production plans from all agencies and develop methods and procedures for their execution."

WHERE TO FIND IT:

Who's Who

National Production Authority 151
Economic Cooperation Administration 151
Interior Dept. 151
General Service Administration 152
Dept. of Commerce Field Offices 152

Buying Directory

Atomic Energy Commission 152
Military Purchasing Offices 152-155
Production Planning Offices 155

NPA Regulations 156-158
Defense Contracts..158-164

NATIONAL PRODUCTION AUTHORITY

You can't produce military or civilian goods without materials—and that means everything from sheet steel and copper to machine tools. The job of National Production Authority is to see that the various segments of industry, as named below, get enough of these materials to produce for defense.

(All addresses Commerce Bldg., unless otherwise designated. Phone: Sterling 9200)

Administrator — Manly Fleischmann, ext. 4423, room 5800.

Public Information—W. Howard Chase, ext. 4464, room 5111. Edward K. Moss, ext. 4466, room 5111.

Industry Operations—Asst. Administrator Horace B. McCoy, ext. 3288, room 3840.

Small Business—James L. Kelly, ext. 2670, room 3890.

Controlled Materials Plan—William C. Skuce, ext. 4563, room 5321.

INDUSTRY DIVISIONS

Machinery Division Director — Marshall M. Smith, ext. 4550-6688, room 2143, Temporary T Bldg.

Consultants to Machinery Div.—Herbert L. Tigges and Col. P. L. Hauser, room 2131, Temporary T, Sterling 9200, ext. 3463.

Machine Tools—Marshall M. Smith (above)

Industrial Machinery — Dewey Crim, ext. 2340, room 2146, Temporary T.

Materials Handling Equipment—J. Perritz, ext. 2309, room 2150, Temporary T.

Valves and Fittings—John String, ext. 2309, room 2150, Temporary T.

Service Industry Machinery, Equipment—C. B. Griffith, ext. 3860, room 2150, Temporary T.

Construction, Mining, Oil Field Machinery—Ralph Schieswahl, ext. 4529-4596, room 2135, Temporary T.

Electrical Machinery — Howard Way, ext. 2345-2517, Temporary T.

Farm Machinery—Robert Terry, ext. 2921, room 2154, Temporary T.

Power Equipment—R. M. Hatfield, ext. 4203-4204, room 1007, Temporary T.

Printing & Publishing Machinery—John V. McCarthy, ext. 2413, room 2247, Temporary T.

Technical & Scientific Supplies—William Thompson, ext. 2324, room 2249, Temporary T.

Protective Equipment—Paul Van Ormer, ext. 2324.

Petroleum Equipment—William L. Clark, ext. 4598, room 2135, Temporary T.

Rubber—Earl W. Glen, ext. 3135, room 1305, Temporary T.

Copper—Frank Hayes, ext. 3918, room 3077.

Electronics—John G. Daley, ext. 3585, room 2107.

Light metals—Nigel H. Bell, ext. 4360, room 3061.

Aluminum—Herbert L. Cullen, ext. 3530, room 3061.

Tin, Lead, and Zinc

Director—Whitman W. Hopton, ext. 3897, room 3077.

Tin, Antimony—Erwin Vogelsang, ext. 3897, room 3077.

Iron and Steel

Director—David B. Carson, ext. 4456, room 38-30-A.

Asst. Director—Frank T. McCue, ext. 3962, room 3324.

Stainless—C. B. Boyne, ext. 3333, room 3827.

Pig iron—John A. Clausson, ext. 2342, room 3825.

Alloy, cold-drawn bars—L. E. Creighton, ext. 3332, room 3827.

Rails and Accessories—John J. Davis, Jr., ext. 3240, room 3819.

Program—Charles Halcomb, ext. 3152, room 3823.

Pipe, tubing—A. P. Happer, ext. 2437, room 3316.

Priorities—Kenneth H. Hunter, ext. 3169, room 3327.

Tool steel—Felix Kremp, ext. 2226, room 3825.

Plant expansion—Harry L. Leyda, ext. 3140, room 3309.

Tin plate—Arthur M. Long, ext. 3334, room 3825.

Structural shapes—R. A. Marble, ext. 2767, room 3324.

Iron, steel castings—A. J. McDonald, ext. 2080, room 3312.

Wire—Norman F. Melville, ext. 3483, room 3324.

Structural and plates—W. E. Mullestein, ext. 2988, room 3324.

Iron, Steel scrap—Marvin Plant, ext. 4520, room 3315.

Sheet and strip—W. B. Quail, ext. 2700, room 3320.

Bars, and semi-finished—J. W. Robinson, ext. 3110, room 3326.

Warehouse — Russell Link, ext. 2681, room 3312.

Forgings, castings—H. F. Weaver, ext. 2004, room 3310.

Ferro-alloys—James H. Critchett, ext. 4164, room 3315.

Nickel—Harold Larson, ext. 4164, room 3823.

Metallurgical—Charles McKnight, ext. 4455, room 3827.

Cobalt—Edwin L. Jenckes, ext. 4164, room 3087.

Transportation Equipment

Director—Robert L. Glen, ext. 542, room 2007, Temporary T.

Automotive—George R. Davis, ext. 2955, room 2011.

Railroad—Ralph C. Barton, ext. 2907, room 2101.

Aircraft—John Matthews, ext. 592-3, room 2025.

Shipbuilding & Boats—Franklin Woodruff, ext. 4697, room 2017.

Automotive Maintenance Equipment—A. R. Laney, ext. 3868, room 2015.

Railroad Motive Power—Matt Tate, ext. 597, room 2016.

ECA

(Connecticut Ave. and H St., NW. Phone Sterling 6400.)

General Machinery & Equipment—George H. Knutson, chief (handles industrial projects), ext. 2988, room 911. C. J. Baker, assistant chief (handles machinery and equipment), ext. 2775, room 917B. Charles E. Houston, chief project analyst, ext. 3011, room 909.

Agricultural Machinery—William R. Nolan, ext. 2541, room 917.

INTERIOR DEPT.

Petroleum & Petroleum Equipment—Bruce K. Brown, Petroleum Administration for Defense, Republic 1820, ext. 3831, room 6654, Department of Interior Bldg.

Electric Power & Equipment—C. B. McManus, Defense Power Administration, Republic 1820, ext. 5237, room 5457, Dept. of Interior Bldg.

Coal & Coal-burning Equipment—Charles W. Connor, Defense Solid Fuels Administration, Republic 1820, ext. 2225, room 5308, Dept. of Interior Bldg.

Mining equipment and facilities—James Boyd, Defense Minerals Administration, Republic 1820, ext. 4815. Room 4614, Department of Interior.

GENERAL SERVICES ADMINISTRATION

(Telephone Executive 4900; address General Services Administration Bldg.)

Plant and Equipment Sales—Thomas L. Peyton, James C. Dwyer, ext. 4110, room G 324.

Industrial Machinery and Equipment Purchases—E. C. Gavreau, Federal Supply officer, District 5700, ext. 4133, 7th and D Sts., SW.

Contract Settlement Review Board—J. W. Follin, ext. 4841, room 6121. (This is the appeal board for contractors, military or civilian, who aren't satisfied with the deal they get when the Government terminates a contract before completion.)

COMMERCE DEPT. FIELD OFFICES

A GOOD PLACE for the small manufacturer to start in his quest for defense business is at one of the Department of Commerce field offices. There he can obtain each day a list of government work on which bids are invited. Each week Commerce releases a list of prime contracts awarded—an excellent source of information for the manufacturer who wants subcontracting work. The manufacturer can obtain at these offices also information and advice about government controls as they affect his business, and copies of regulations and orders issued by the National Production Authority. In addition, publications telling how to sell to the government are available at the field offices.

Albuquerque—Hanosh Bldg., 203 W. Gold Ave.

Atlanta, Ga.—P. O. Box 1595, 418 Atlanta National Bldg., 50 Whitehall St., S.W.

Baltimore—314 U.S. Appraisers' Stores Bldg., 103 S. Gay St.

Boston—1800 Customhouse, 2 India St.

Buffalo, N.Y.—242 Federal Bldg., 117 Ellicott St.

Butte, Mont. — 301A O'Rourke Estate Bldg., 14 W. Granite St.

Charleston, S.C. — 310 Peoples Bldg., 18 Broad St.

Cheyenne, Wyo.—304 Federal Office Bldg., 21st St. and Carey Ave.

Chicago—1150 McCormick Bldg., 332 S. Michigan Ave.

Cincinnati—1204 Federal Reserve Bank Bldg., 105 W. Fourth St.

Cleveland—215 Union Commerce Bldg., 925 Euclid Ave.

Dallas, Texas—1114 Commerce St.

Denver, Colo.—210 Boston Bldg., 828 17th St.

Detroit, Mich.—1038 New Federal Bldg., 230 W. Fort St.

El Paso, Texas—206 U.S. Court House

Hartford, Conn.—224 Post Office Bldg., 135 High St.

Houston, Texas—602 Federal Office Bldg.

Jacksonville, Fla. — 425 Federal Bldg., 311 West Monroe St.

Kansas City, Mo.—2601 Fidelity Bldg., 911 Walnut St.

Los Angeles—1546 U.S. Post Office & Court House, 312 N. Spring St.

Louisville, Ky.—631 Federal Bldg.

Memphis, Tenn.—229 Federal Bldg.

Miami, Fla.—947 Seybold Bldg., 36 N.E. First St.

Milwaukee, Wis. — 700 Federal Bldg., 517 E. Wisconsin Ave.

Minneapolis, Minn.—338 Midland Bank Bldg., 401 Second Ave., South

Mobile, Ala.—308 Federal Bldg., 109-13 St. Joseph St.

New Orleans—1508 Masonic Temple Bldg., 333 St. Charles Ave.

New York, N.Y.—42 Broadway

Oklahoma City, Okla.—311 Council Bldg., 102 N. W. Third St.

Omaha, Nebr.—502 W. O. W. Bldg., 1319 Farnam St.

Philadelphia, Pa.—812 Lafayette Bldg., 437 Chestnut St.

Phoenix, Ariz.—425 Security Bldg., 234 N. Central Ave.

Pittsburgh, Pa.—1013 New Federal Bldg., 700 Grant St.

Portland, Ore.—217 Old U.S. Court House, 520 S.W. Morrison St.

Providence, R.I. — 203 Custom House, 24 Weybossett St.

Reno, Nev.—Cladianos Bldg., 118 West Second St.

Richmond, Va.—Room 2, Mezzanine, 801 E. Broad St.

St. Louis, Mo.—910 New Federal Bldg., 1114 Market St.

Salt Lake City, Utah—508 Post Office Bldg., 350 So. Main St.

San Francisco, Calif.—306 Custom House, 555 Battery St.

Savannah, Ga.—218 U.S. Court House and Post Office Bldg., 125-29 Bull St.

Seattle, Wash.—809 Federal Office Bldg., 909 First Ave.

. . . YOUR

AIR FORCE

Procurement Div., Air Material Command, Wright-Patterson Air Force Base, Dayton, Ohio

Aircraft
Aircraft spare parts, equipment and accessories
Aircraft engines, spare parts and accessories
Aerial targets and gliders
Aircraft armament and accessories
Aircraft ground servicing and maintenance equipment
Guided missiles and targets
Hangar equipment
Photographic equipment
Portable laboratories and shops
Radar and aircraft communication equipment
Emergency rescue equipment
Aircraft instruments
Metals and composition materials
Aircraft hardware
Aircraft antifriction bearings, parts
Air field night lighting equipment

NAVY

Bureau of Aeronautics

18th and Constitution Ave., Washington, D. C.

Procurement of aeronautic items, including aeronautical electronic items

Bureau of Ordnance

18th and Constitution Ave., Washington, D. C.

Procurement of ordnance items, including fire control equipment.

Bureau of Ships

18th and Constitution Ave., Washington D. C.

Procurement of ships, components, and shipboard electronics items

Bureau of Supplies and Accounts

18th and Constitution Ave., Washington, D. C.

Procurement of common-use items and items assigned by other bureaus.

Bureau of Yards and Docks

Yards and Docks Annex, (Arlington, Va.), Washington, D. C.

Procurement of heavy weight-handling equipment, public utilities and permanent facilities

GUIDE TO GOVERNMENT PROCUREMENT

Other Navy Buying Offices

Headquarters, Marine Corps, Arlington Annex (Arlington, Va.), Washington, D. C. (Items peculiar to Marine Corps)

Office of Naval Research, 18th and Constitution Ave., Washington, D. C., (research and development)

Navy Purchasing Office, 844 North Rush St., Chicago. (electronic items, some heavy machinery and general procurement)

Naval Supply Depot, Mechanicsburg, Pa. (ships spare parts)

Naval Submarine Base, New London, Conn. (items peculiar to submarines)

Naval Aviation Supply Office, Oxford Ave. and Martins Mill Rd., Philadelphia 12, Pa. (aeronautical items, and automotive and material handling spare parts)

Naval Air Material Center, Naval Shipyard, Philadelphia 12, Pa. (aeronautical items)

Naval Shipyard, Philadelphia 12, Pa. (submarine spare parts)

Naval Shipyard, Portsmouth, N. H., electrical fittings)

Naval Gun Factory, Washington 25, D. C. (items pertaining to ordnance equipment)

Naval Ordnance Plant, York, Pa. (items pertaining to ordnance equipment)

ARMY

Corps of Engineers

Chicago Procurement Office, Corps of Engineers,
158 West Harrison St., Chicago

Air conditioning and refrigeration units and equipment
Bridges and bridging equipment
Construction & maintenance equipment, including: augers, air compressors, conveyors, cranes, gas cylinders, dredging machinery, derricks, elevators, asphalt finishers, hoists, winches and windlasses, loaders, mowers, snow plows, pneumatic tools, road rollers, road rooters, sawmills and powered saws, scrapers, tractors, welders, well drilling machinery and equipment, woodworking machinery
Construction materials, including: boiler drums, builders hardware, airplane landing mats, nails and spikes, pipe, railway track accessories, roofing, steel, tanks, wire
Electrical equipment and supplies, including: capacitators, circuit breakers, floor sanders and vacuum cleaners, floodlights, generators, lamps, motors, pole line equipment, switches, transformers
Fire-fighting equipment
Fuel burning equipment
Map reproduction equipment
Plumbing, heating, and miscellaneous equipment
Searchlights, sniperscopes, snooperscopes, metascopes
Surveying and mapping equipment
Water and sewage treatment equipment

Chemical Corps

Chemical Corps Procurement Agency,
Army Chemical Center, Md.

Chemical Corps materials handling equipment
Collective protectors and accessories
Containers and fittings
Decontaminating equipment
Dust respirators and accessories
Flamethrowers
Gages and laboratory equipment
Gas masks and accessories
Grenades; tear, smoke, incendiary
Magnesium metal
Metal components for incendiary and chemical bombs
Smoke tanks
Tools; hand and machine (special purpose)

Medical Department

Army-Navy Medical Procurement Office,
84 Sands St., Brooklyn, N. Y.

Diagnostic, surgical and dental instruments
Orthopedic, medical, dental, surgical, hospital and laboratory supplies
Surgical, dental, hospital and laboratory equipment
Veterinary equipment and supplies
X-ray machines and supplies

Ordnance Department

Aberdeen Proving Ground, Aberdeen, Md.
Detroit Arsenal, Centerline, Mich.
Detroit Ordnance-Tank Automotive,
Center, 1501 Beard St., Mich.
Frankford Arsenal, Philadelphia
Picatinny Arsenal, Dover, N. J.
Raritan Arsenal, Metuchen, N. J.
Rock Island Arsenal, Rock Island, Ill.
Springfield Armory, Springfield, Mass.
Watertown Arsenal, Watertown, N. Y.
Watervliet Arsenal, Watervliet, N. Y.

(Detroit)

Automobiles, bicycles, combat vehicles, motorcycles, motor scooters, trucks and trailers, tanks, tractors,
Automotive equipment and maintenance supplies; batteries, wet; battery chargers

ARMY ORDNANCE DISTRICT OFFICES

If you make an item that Army Ordnance buys, go first to one of the following offices. These Ordnance Department district offices have authority to grant contracts up to a value of $5 million. Included in the list are the Detroit Arsenal and Detroit Tank Automotive Center, not district offices, but which do a considerable amount of Ordnance buying.

Birmingham, Ala.—734 Frank Nelson Bldg. Phone 53-1641.

Boston—Boston Army Supply Base. Liberty 2-6000.

Chicago—209 W. Jackson Blvd. Harrison 7-6141.

Cleveland—Auditorium Bldg., 1367 E. 6th St. Cherry 7-6471.

Detroit—6301 W. Jefferson Ave. Vinewood 3-6600.

Detroit Arsenal—Center Line, Mich. Jefferson 6-5000.

Detroit Tank Automotive Center—1501 Beard St. Jefferson 6-5000.

Los Angeles—35 N. Raymond Ave., Pasadena, Calif. Sycamore 3-6716.

New York—111 East 16th St. Gramercy 7-4700.

Philadelphia—1500 Chestnut St. Gladstone 5-3800.

Pittsburgh—311 Old Post Office Bldg., 4th Ave. & Smithfield St. Grant 9900.

Rochester, N. Y.—1260 Sibley Tower Bldg., Room 1260, 68, 70. Baker 7260.

St. Louis—4800 Goodfellow Blvd. Evergreen 3011.

San Francisco—Oakland Army Base, Bldg. No. 1, Wing 3, Oakland, Calif. Exbrook 2-7211.

Springfield, Mass.—Springfield Armory. Phone 7-4381.

Cincinnati—Big Four Bldg. Dunbar 2200.

MILITARY PURCHASING OFFICES . . . continued

(Frankford)
Ammunition (small arms and artillery)
Fire control equipment
Cartridge brass
Optical instruments and accessories
Watches and clocks

(Picatinny)
Explosive and separate explosive ingredients
Flare, rockets and signals
Explosives processing equipment
Grenades and land mines

(Raritan)
Ordnance maintenance materials: cleaners, lubricants, paints, preservatives, recoil oils and fluids, special oils and fluids

(Rock Island)
Artillery carriages, mounts, and recoil mechanisms
Launchers
Machine guns
Parachests, paracaissons, paracrates
Small arms
Targets and target materials, for artillery and small arms

(Springfield)
Ammunition clips and magazines
Machine guns
Small arms, pistols and rifles

(Watertown)
Artillery carriages, mounts, recoil mechanisms
Generating equipment, electrical (for seacoast artillery)

(Watervliet)
Artillery cannon
Mortars
Recoilless rifles

(At all offices listed above)
Components of ordnance equipment
Measuring and testing instruments and equipment
Metal and metal products: wire, strips, bars, tubes, pipe, rods, shapes, sheets, plates, castings and forgings, bolts, nuts, screws, washers, pipe fittings
Electric cable and wire
Electroplating equipment and supplies; heat-treating furnaces and accessories; welding equipment and supplies; spray-painting equipment and supplies; wood-working machinery and supplies; testing equipment
General maintenance supplies; electrical supplies, light and power; general construction supplies
Machine and machine tools—lathes,
Weighing scales—sensitive balances—and larger

Quartermaster Corps

New York Quartermaster Purchasing Office, 111 East 16th St., New York
Chicago Quartermaster Purchasing Office, 1819 West Pershing Road, Chicago
Columbus General Depot, Columbus, Ohio
Jeffersonville Quartermaster Depot, Jeffersonville, Ind.
Philadelphia Quartermaster Depot, 2800 South 20th Street, Philadelphia, Pa.

(New York)
Badges, decorations, insignia and medals (cloth and metal)
Goggles, glasses and eye shades and shields
Musical instruments, components, and parts

(Chicago)
Cots, metal and wood
Equipment and machines (including parts, except materials handling equipment and special-purpose vehicles): agricultural, athletic, bakery and mess, commissary, dry-cleaning, heating, kitchen, laboratory, laundry, bath, and fumigation, materials handling, petroleum handling, printing, refrigeration, ski and cold climate
Furniture, metal and wood, all types
Hardware and metal components
Helmets, complete
Kitchen utensils, cutlery, tableware
Kits (barber, mending, sewing, toilet, and tool)
Lockers, trunk
Metal fabricated end-products, buckets, cabinets, cans, canteens, cups, trays, etc.)
Poles and pins for tentage
Scales
Springs, bed
Tags, identification
Tools, hand and power operated (except common hand tools assigned to Navy)
Vehicles, hand and power operated assigned to QMC

(Columbus)
Spare parts for materials handling equipment and special purpose vehicles

(Jeffersonville)
Caskets, shipping cases, components and accessories
Components, findings and miscellaneous supplies for use in manufacturing contracts assigned to the Jeffersonville Depot Factory

(Philadelphia)
Miscellaneous spare parts for use in Philadelphia Quartermaster Depot repair shop and repair of musical instruments
Components, findings and miscellaneous supplies for use in manufacturing contracts assigned to the Philadelphia Quartermaster Depot, Manufacturing Division

Signal Corps

Signal Corps Procurement District, 2800 South 20th St., Phila.
Antennas
Batteries
Cable
Coils and capacitors
Communications equipment (except air-borne)
Cord sets
Electron tubes
Facsimile and recording equipment
Head sets
Flashlights and electric hand lanterns
Metal fabricated products for communications equipment
Meters—electronic indicating; test and recording
Meteorological equipment
Microphones
Mine detectors
Plugs
Power units
Public address systems
Radar and associated equipment
Radio equipment
Reel units
Resistors
Telephone, telegraph, and teletype equipment
Test sets and meters
Tools and metal fabricated products
Transformers
Transistors
Sockets
Switches
Visual and sound signaling and ranging equipment
Wire

Transportation Corps

Marietta Transportation Corps Depot, Marietta, Pa.
Supply & Facilities Div., Office Chief of Transportation, Washington 25, D.C.
Railroad and rapid transit lighting fixtures
Locomotives, railroad service
Self-propelled cars
Cars, except self-propelled
Brake subassamblies and brake rigging, locomotive and car
Locomotive cranes, parts, and attachments (except wrecking cranes)
Iron castings (not machined)
Steel castings (not machined)
Rolled wheels and axles

ATOMIC ENERGY COMMISSION...MAJOR PURCHASING OFFICES

New U-235 separation plant—F. H. McGraw & Co., Hartford, Conn. Later, will open offices in or near Paducah, Ky., at new plant site.

New $500-million Savannah River plant—Procurement agent J. W. Hammett, E. I. DuPont De Nemours & Co., temporarily at Municipal Auditorium, Augusta, Ga. Later to site of plant.

Brookhaven National Laboratory, Upton, Long Island, N. Y.—R. H. Jones, purchasing agent.

Oak Ridge plants—J. J. Fritz, Carbide & Carbon Chemicals Co., P. O. Box P, Oak Ridge, Tenn. Roane-Anderson Co., P. O. Box 456, Oak Ridge, Tenn. W. H. Leedom, purchasing agent.

Miamisburg, Ohio — Monsanto Chemical Co., E. C. Svaboda, purchasing agent, construction division. H. L. Williams, purchasing agent, operating division.

Richland, Wash. (Hanford)—General Electric Co., R. V. Lawson purchasing agent.

Schenectady, N. Y. — General Electric Co, P. O. Box 1072. F. H. Croninger, purchasing agent.

Argonne laboratories—P. O. Box 5207, Chicago 80, W. H. Byford, purchasing agent.

Radiation Laboratory, University of California—Berkely, Calif. C. L. Blue, purchasing agent.

Pittsburgh — Westinghouse Electric Co., Atomic Power Division, P. O. Box 1468, Pittsburgh 30. J. A. Schultz, purchasing agent.

Idaho Operations Office—U. S. Atomic Energy Commission, Idaho Falls, Idaho. A. R. Tuttle, chief, administrative branch.

Bendix Aviation Corp.—Purchasing agent. P. O. Box 1066, Kansas City 4, Mo.

Via Co., Los Alamos, New Mexico —O. H. Nolte, purchasing agent.

University of California, Los Alamos, N. M.—Harry S. Allen, director of supply.

Sandia Corp., Sandia Base, Albuquerque, N. M. —purchasing agent.

PRODUCTION PLANNING OFFICES

When you have obtained a contract from one of the sources just listed, you may want help in planning production.

Major field and headquarters offices of government agencies responsible for production planning with industrial management are listed below. Production planning offices for Army departments are located at addresses given for the various procurement offices, pages 153-154, and at Ordnance district offices. Other Navy production planning offices are located at major shipyards.

Baltimore, Md.
Inspector of Naval Material, USN
401 Water Street

BuAeronautics Rep., USN
Glenn L. Martin Company

Boston, Mass.
Supervising Inspector of Naval Material, USN
495 Summer Street, Navy Bldg.

Industrial Manager, USN
Boston Naval Shipyard

Brooklyn, N.Y.
Bureau of Aeronautics
General Representative, USN
N.Y. Naval Shipyard, Bldg. 3

Supervising Inspector of Naval Material, USN
N.Y. Naval Shipyard, Bldg. 3

Industrial Manager, USN
New York Naval Shipyard

Chicago, Ill.
Supervising Inspector of Naval Material, USN
226 W. Jackson Blvd.

Inspector of Naval Material, USN
226 W. Jackson Blvd.

Industrial Manager, USN
844 Rush Street
American Fore Bldg., Room 130

Air Force Proc. Field Office
209 W. Jackson Blvd.

Cleveland, Ohio
Supervising Inspector of Naval Material, USN
WJW Building

U.S. Navy Inspector of Machinery
General Motors Corporation
Cleveland Diesel Engine Div.
2160 W. 106th Street

BuAeronautics Rep., USN
Thompson Products, Inc.

Columbus, Ohio
Transportation Corps, USA
Ind'l. Mob. Planning Office
Columbus General Distr. Depot

BuAeronautics Rep., USN
Curtiss-Wright Corp.—Airplane Div.

Dallas, Texas
Dallas Chemical Proc. Dist., USA
1114 Commerce Street

Dallas Procurement Office
Corps of Engineers, USA
1114 Commerce Street

BuAeronautics Repr., USN
Naval Ind. Res. Plant Aero.
Post Office Box 5907

Dayton, Ohio
Hqs. Air Matériel Command, USAF
Director Proc. & Ind'l. Plng.
Industrial Mob. Planning Div.

BuAeronautics, Gen. Repr., USN
Wright-Patterson Air Force Base

Detroit, Mich.
Inspector of Naval Material, USN
11111 French Road

Air Force Proc. Field Office
W. Warren & Lonyo Avenues

Downey, Calif.
BuAeronautics, Repr., USN
North American Aviation, Inc.

East Hartford, Conn.
BuAeronautics, Repr., USN
Pratt and Whitney Aircraft Div.
United Aircraft Corp.

El Segundo, Calif.
BuAeronautics, Repr., USN
El Segundo Division
Douglas Aircraft Co., Inc.

Essengton, Pa.
U.S. Navy Inspector of Machinery
Westinghouse Electric Corporation

BuAeronautics, Repr., USN
Westinghouse Electric Corp.

Indianapolis, Ind.
BuAeronautics Repr., USN
Allison Div., General Motors Corp.

Kansas City, Mo.
BuAeronautics Repr., USN
Westinghouse Electric Corp.
Box 288

Los Angeles, Calif.
Bureau of Aeronautics
General Representative, USN
1206 S. Santee Street

Inspector of Naval Material, USN
1206 S. Santee Street

Air Force Proc. Field Office
P.O. Box 3849, Terminal Annex
155 W. Washington Boulevard

Milwaukee, Wis.
Inspector of Naval Material, USN
Federal Building

Minneapolis, Minn.
Naval Inspector of Ordnance, USN
Northern Pump Company

New Orleans, La.
Transportation Corps, USA
Ind'l. Mob. Planning Office
Poland & Dauphine Streets

Industrial Manager, USN
Naval Station

New York City, N.Y.
Supervisor of Shipbuilding, USN
11 Broadway
Air Force Proc. Field Office
67 Broad Street

Philadelphia, Pa.
Signal Corps, USA, Proc. Dist.
2800 South 20th Street
Supervising Inspector of Naval Material, USN, Philadelphia Dist.
Industrial Manager, USN
Philadelphia Naval Shipyard

Pittsburgh, Pa.
Supervising Inspector of Naval Material, USN
401 Old Post Office Building

Rochester, N.Y.
Naval Inspector of Ordnance, USN
Eastman Kodak Company

Rockaway, N.J.
BuAeronautics Repr., USN
Reaction Motors, Inc.
Elm & Sickle Streets

San Diego, Calif.
BuAeronautics Repr., USN
Consolidated-Vultee Aircraft Corp.

San Francisco, Calif.
Inspector of Naval Material, USN
Bldg. 18, Foot of 20th Street
Asst. Industrial Manager, USN
San Francisco Naval Shipyard

Schenectady, N.Y.
U.S. Navy Inspector of Machinery
General Electric Company

St. Louis, Mo.
Inspector of Naval Material, USN
Old Customs House
815 Olive Street
BuAeronautics Repr., USN
McDonnell Aircraft Corp.
Post Office Box 156

Syracuse, N.Y.
Inspector of Naval Material, USN
General Electric Company
Electronics Parts Plant

Teterboro, N.J.
BuAeronautics Repr., USN
Eclipse Pioneer Div.
Bendix Aviation Corp.

Washington 25, D.C.
Department of the Army
Office of Director of Logistics

Department of the Navy
Office of Naval Material

Department of the Air Force
Deputy Chief of Staff, Matériel
Director Procurement & Industrial Planning
Industrial Planning Division

National Advisory Committee for Aeronautics
Procurement Division
1724 "F" Street, NW

United States Maritime Commission
Chief, Bureau of General Services
4814 A Commerce Building
14th and Constitution Avenue, NW

METALWORKING PRODUCTION CONTROLS

NPA REGULATIONS

Reg. 1—Inventory control. Prevents accumulation of excessive inventories of materials in short supply by limiting to a "practicable minimum working inventory" the quantities of such materials that can be ordered, received, or delivered. "Practicable minimum working inventory" means the smallest quantity of material from which a person can reasonably meet his deliveries or supply his services on the basis of his currently scheduled method and rate of operation. Regulations apply to pig iron, gray iron castings, steel (carbon and alloy, including stainless), rough forgings, iron and steel scrap, and the following metals and minerals: aluminum, columbium, cobalt, copper, magnesium, manganese, nickel, tin, tungsten, and zinc.

Interpretations 1, 2 and 3 to Reg. 1—Explain (1) Action required to adjust orders; (2) Persons subject to exemption of imported materials; (3) Deliveries through intervening dealers after adjustment of orders.

Reg. 2—Defense priorities system (amended). Establishes a system of preference ratings for defense work, the rating to be identified by the prefix DO and two digits identifying the procurement. All DO rated orders have equal preferential status. Manufacturer who gets a rated order may "extend" the order to get the material which he will deliver on that order or which will be physically incorporated in the material or equipment which he will deliver.

Interpretation 1 to Reg. 2—Permits extension of DO ratings to obtain containers to fill defense contracts for petroleum and food.

Delegation 1 under Reg. 2—Delegates rating authority to Dept. of Defense, and permits redelegation of this authority to other government agencies.

Identifying Digits Used In Assigning DO Ratings

Dept. of Defense
DO-01 Aircraft
DO-02 Guided missiles
DO-03 Ships
DO-04 Tank-automotive
DO-05 Weapons
DO-06 Ammunition
DO-07 Electronic & communication equipment
DO-08 Fuels and lubricants
DO-09 Clothing and equipage
DO-10 Transportation equipment
DO-11 Building supplies & equipment for overseas (troop) construction
DO-21 Miscellaneous
DO-22 Dept. of Defense construction (contract)
DO-98 Production equipment for certain contractors

Atomic Energy Commission
DO-40 Operations
DO-41 Construction, except equipment
DO-42 Construction equipment
DO-43 Prime & sub-contractor's privately owned facilities
DO-44 Other privately owned facilities

Nat'l Advisory Committee for Aeronautics
DO-50 Operations
DO-51 Construction

U. S. Coast Guard
DO-60 Miscellaneous
DO-61 Aircraft
DO-62 Construction
DO-63 Ships

"Basket Rating"
DO-99 Miscellaneous (common components or shelf items.)

Delegation 2—Delegates rating authority to Atomic Energy Commission, and permits AEC to authorize ratings of production equipment.

Delegation 3—Delegates rating authority to National Advisory Committee for Aeronautics.

Delegation 4—Delegates rating authority to Coast Guard.

Delegation 5—Makes Dept. of Interior the claimant agency for mining machinery.

Reg. 3—Reciprocal priorities system for U.S. and Canada. Describes how and to what extent contracts and orders required to support defense programs of U.S. or Canada may have DO rating. If rated order from U.S. manufacturer is placed with supplier in Canada, the Canadian supplier may use the DO rating to acquire materials in U.S.

NPA ORDERS

M-1 —Steel (amended). Applies to 31 different steel-mill products, and designates the percentage of each for which the mill must accept defense orders. These percentages vary from 5-25% and are based on average monthly shipments made during first eight months of 1950. Purpose is to provide equitable distribution of rated orders among all steel producers of the particular products to make possible maximum production and to reduce to minimum disruption of normal distribution. Sets "lead time" for mill scheduling.

Supplement 1 to M-1—Schedules steel for U.S. Freight Car Program.

Supplement 2 to M-1—Schedules steel for Great Lakes Vessels Program.

Supplement 3 to M-1—Schedules steel for Canadian Freight Car Program.

M-2 —Rubber limitation and conservation (amended). Fixes minimum percentages of synthetic rubber that must be used in certain listed rubber products. Limits consumption of natural rubber and natural rubber latex. Establishes procedure and basis for allocation of government-produced synthetic rubber. Prohibits importation of crude natural rubber or natural rubber latex (excluding guayule, balata and guttapercha), except by General Services Administration.

M-3 Columbium bearing steel. Prohibits production, sale, delivery or purchase of columbium bearing steel except on DO rated orders. Prohibits use of ferro - columbium bearing steels in any application or process where ferro-columbium-tantalum bearing steels may be used as a substitute for columbium bearing steels. Forbids use of either if any other substitute meets requirements.

M-4 —Construction (amended). Prohibits construction of 50 types of buildings for "recreational, amusement or entertainment purposes, whether public or private," if work had not been commenced before Oct. 27, 1950. Maintenance and repair are permitted.

M-5 —Aluminum. Applies to 23 different aluminum forms and products, and designates percentage of each for which the producer must accept defense orders. Percentages vary from 15-40% and are based on average monthly shipments made during first eight months of 1950. Producers and fabricators can reject rated orders received less than 60 days prior to first day of month in which shipment is requested.

M-6 —Steel distributors (amended). Requires steel producers to establish regular allotments of steel for purchase by steel distributors based upon their average monthly purchases over an established base period. Provides special rules for extension of DO rated orders by steel distributors and specifies a tonnage limitation and item limitation for required acceptance of rated orders by them. Also allocates steel to Canadian warehouse distributors.

M-7 —Use of aluminum (amended). Applies to 24 forms and products of aluminum, and limits their use for civilian manufacture or construction to specified percentages of average monthly use during first six months of 1950. During six months' period starting December 1, 1950, no person shall use for maintenance, repair, and operating supplies a quantity in excess of that used for such purposes during first six months of 1950.

Direction 2 to M-7—Permits automatic adjustments of aluminum use in first quarter of 1951.

Direction 3 to M-7—Permits adjustments of aluminum use by manufacturers of component parts made wholly or partly of aluminum.

M-8 —Tin (amended). Sets forth limitations on inventories of pig tin, alloys, and other materials containing tin. Explains conditions under which reports are required in connection with production, distribution, importance, use, and inventories of pig tin. Prohibits use of pig tin where secondary tin can be used.

M-9 —Zinc. Provides rules for placing, accepting, and scheduling rated orders for zinc. Applies particularly to producers, fabricators, and dealers of zinc products.

M-10—Cobalt (amended). Prohibits use of cobalt in manufacture of specified products which are relatively less essential or in which substitute materials may effectively be used. Establishes limits on additions to inventory and brings cobalt under allocation by prohibiting deliveries not covered by allocation authorizations to be issued monthly by NPA.

M-11—Copper and copper-base alloys. Provides rules for placing, accepting and scheduling rated orders for unalloyed copper, copper-base alloy, brass mill products, copper wire mill products, foundry copper products.

M-12—Use of copper and copper-base alloys. Limits nonrated use of copper. Describes how copper remaining after allowing

for requirements of national defense may be distributed and used in civilian economy.

M-13—Rayon. Provides for equitable distribution of rated orders among producers of high tenacity rayon yarn.

M-14—Nickel. Limits all consumption of primary nickel for non-defense purposes during first quarter of 1951 (except for maintenance, repair and operating supplies) to 65% of the average quarterly consumption during first six months of 1950. Applies to the following forms of primary nickel: electrolytic nickel, ingots, pig, rolled and cast anodes, shot, oxides and residues derived directly from new nickel.

M-15—Use of zinc. Limits consumption of zinc and zinc products beginning January 1, 1951 (except for maintenance and repair work), to 80% of the average quarterly consumption during the first six months of 1950.

M-16—Distribution of copper and copper-base alloy scrap (amended). Provides that no person, other than producers of copper raw materials, may melt or process copper scrap originating in his own plant. Regulates acceptance, delivery and distribution (whether on purchase, toll agreement or otherwise) of copper scrap and copper-base alloy scrap. Prohibits undue accumulations of such scrap.

M-17—Electronic components or parts. Provides for equitable distribution of rated orders among manufacturers of the following types of electronic components: pressed, extruded, and machined steatite electrical ceramic products; electron tubes (except power tubes); fixed composition resistors.

M-18—Pigs' and hogs' bristles and bristle products. Establishes limits on inventories.

M-19—Cadmium. Controls deliveries of cadmium from producer or distributor. States purposes for which cadmium, cadmium-containing items, and cadmium-plated items may be produced. Imposes inventory controls on cadmium.

DEFENSE CONTRACT AWARDS

Defense contracts awarded by U.S. armed services from invasion of Korea up to now are published on this page and next six pages. They are confined to contracts of $500,000 or more, except when a manufacturer has two or three contracts for lesser amounts totaling at least $500,000. The smaller contracts are listed in such cases.

This listing is taken from news pages of AMERICAN MACHINIST beginning with issue of August 7, 1950, and continuing up through January 8, 1951. If you wish complete list of contracts of $100,000 or more, see news sections of issues referred to.

Omitted from this list are contracts which have not been made public because of their high degree of secrecy.

AMERICAN MACHINIST will continue to print in each issue defense contracts for $100,000 or more as they are awarded.

ARMY ORDNANCE

ACF Brill Motors Co., Philadelphia	
Ambulance buses and spare parts	$ 107,043
Baffles, bases bushings, chain drives, flanges, gaskets, etc.	485,950
Allis-Chalmers Mfg. Co., Milwaukee	
Shims, washers, pins, gaskets	113,708
Covers, roller	339,194
Plates, elbow, screen	487,889
Misc. covers, bushings, etc.	110,468
Rods, gears, yokes, springs, gaskets, etc.	116,362
Spare parts and supplies	238,775
American Car & Foundry Co., New York	
Howitzer motor carriages	30,000,000
Arma Corp., Brooklyn, N. Y.	
Range finders	4,100,000
Armco Steel Corp., Middletown, Ohio	
Steel discs for 75mm and 57mm cartridge cases	507,732
Austin Metal Products, Inc., Detroit	
Windshield assemblies	725,750
Auto-Soler Co., Atlanta, Ga.	
Sight units with equipment	$ 550,165
Bay Engine & Parts Co., San Francisco	
Section valves, guide	196,312
Washers, covers, crank cases, water pumps, plates, levers, camshafts, pulleys, bearings	108,147
Bell & Howell Co., Chicago	
Periscopes	100,000
Bendix Products Div., Bendix Aviation Corp., South Bend, Ind.	
Valve assemblies, hydrovac check retainers, brake cylinders, brake control valve housings, power brake control screens, hydrovac cylinder repair kits	182,712
Plugs, nuts, brackets, stud washers, screws, levers, valves, etc.	114,129
Bushings, gaskets, etc.	262,436
Air filters, hydrovac cylinder assembly kits	329,628
Shaft, front axle assemblies	101,210
Automotive parts & supplies	429,784
Benrus Watch Co., Waterbury, Conn.	
Plungers, body assembly for delay plunger	615,978
Bethlehem Steel Co., Bethlehem, Pa.	
Steel, alloy, bars, for breech blocks	348,230
Forgings, tube, alloy steel, for 90mm guns	1,359,375
Biederman Motors Corp., Cincinnati	
Engines, accessories	2,843,918
Automotive parts	587,525
Budd Co., Detroit	
Rings, side, tire rim, wheel assembly	237,925
Wheel assembly with locking ring	297,920
Butler Mfg. Co., Minneapolis	
Water tanks	654,200
Burgess Norton Mfg. Co., Geneva, Ill.	
Tank track parts	3,793,619
Cadillac Motor Car Div., General Motors Corp., Detroit	
Light tanks	110,000,000
Engine assemblies, spare parts, transmission assembly	2,000,000
Chevrolet Motor Div., General Motors Corp.	
Pickup trucks, ½ ton	7,437,093
Stake & platform trucks, 1½ ton	2,612,053
Automobiles, sedan	1,314,819
Brake shoe assemblies	135,002
Carryall trucks, ½ ton	677,473

Chrysler Corp., Detroit
- Engines ..... $ 5,238,856
- Auto spare parts 1,133,112
- Axle assemblies, differential & carrier assemblies 5,213,064
- Differential repair kits, cases, covers 166,761
- Bolts, brackets 146,659
- Misc. auto parts and supplies 222,060

Continental Motors Corp., Detroit
- Engine assemblies 6,151,536
- Gas engines, spare parts 5,000,000
- Engine head cylinders, with assembly 4,553,555
- Kits gasket sets, bearings 109,475

Davis Aircraft Engrg, Inc., Cambridge, Mass.
- Feed mechanisms 617,066

Dellenbarger Machine Co., Inc., New York
- Preproduction units of working model machine guns and spare parts 566,636

Diamond T Motor Car Co., Chicago
- Engine accessories, assemblies 2,311,808
- Tractor trucks 791,250
- Engines with accessories 309,195
- Generator assemblies 124,600
- Automotive parts and supplies 274,005
- Transmission bushings, tubes 336,140
- Misc. supplies and parts 180,289

Dunbar Kaple, Inc., Geneva, Ill.
- Cargo trailers, ¼ ton 1,632,286

Eastman Kodak Co., Rochester, N. Y.
- Range finders 2,400,000

Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, N. J.
- Master junction box and spare parts 200,000

Thomas A. Edison, Inc., West Orange, N. J.
- Batteries 1,278,900

Electric Auto Lite Co., Detroit
- Pins, drive assembly generators, cups, etc. 474,530
- Sealed lamp units 149,157
- Starter assembly, rings 164,496
- Auto spare parts 271,077
- Distributor pins 175,245
- Head lights, rotors, distributors, starter assemblies 177,205

Fargo Motor Corp., Detroit
- Automobiles, 5-passenger sedan 1,304,484
- Trucks 125,477

Federal Cartridge Corp., Minneapolis
- Cartridges, .30 cal.; reactivation of Twin Cities Arsenal 8,603,500

Federal Motor Truck Co., Detroit
- Misc. carriers & end assemblies 122,164
- Differential, transfer assembly flange 270,420
- Repair kits, fan overhaul, transmission assembly 204,672
- Shock absorbers 386,700
- Plate, shoe 268,239
- Shaft assembly, shaft, joint, collar, yokes, etc. carrier differential assembly, brake shoe, bushings 229,000
- Brake shoe assembly, front axle 343,995
- Pins, bolts, tubes, etc. 423,511
- Housings, sleeve, guard, socket 315,453
- Gear flanges 100,612
- Auto parts and supplies 1,471,069

Firestone Tire & Rubber Co., Akron, Ohio
- Auto spare parts 1,490,215
- Strip-8 shoe, shoe assembly 12,546,111
- Disk wheels with tires 3,662,000
- Rifles, 57mm 310,419
- Spare parts for 57mm rifles 282,508
- Rifles, 75mm 359,468
- Spare parts for 75mm rifles 179,986
- Rifles and spare parts 347,432

Ford Motor Co., Detroit
- Buses 1,986,813
- Automobiles, 5-passenger sedan 1,314,164

Gar-Wood Industries, Inc., Wayne, Mich.
- Cargo bodies 506,706
- Shaft, cover, carrier, rail winch assembly ..... $ 209,363
- Lever shaft, arm, hub assembly, cylinder sprocket, etc. 215,614
- Tubes, pin, sheaves, misc. winches, bearings, etc. 181,409

General Electric Co., Cleveland
- Misc. lamp parts 592,667

General Motors Corp., Detroit
- Range finders 8,000,000

Gibbs Mfg. & Research Corp., Janesville, Wis.
- Renovation & conversion of mechanical time fuzes 1,662,000

Gibson Mfg. Co., Longmont, Colo.
- Cartridge cases, 20mm 908,225

Gilbert & Barker Mfg. Co., West Springfield, Mass.
- Spare parts for telescope mounts 1,140,000

GMC Truck & Coach Div., General Motors, Pontiac, Mich.
- Dump trucks 2,433,897
- Trucks, tractor & dump 1,165,472
- Bushings, crankshaft, insulator, link, etc. 265,550
- Shims, front, axle packing, steering gear 147,175

B. F. Goodrich Co., Akron
- Strip-8 shoe, shoe assembly 5,704,868

Goodyear Tire & Rubber Co., Akron
- Strip-8 shoe, shoe assembly 12,546,111
- Auto spare parts 1,377,530

Gould National Batteries, St. Paul, Minn.
- Batteries 1,258,600

Guide Lamp Div., General Motors Corp.
- Lamp assemblies 210,716

Harrington & Richardson Arms Co., Worcester, Mass.
- Rifles, .22 cal. 256,462
- Bolt assemblies for .30 cal. BAR 160,456
- Barrels 890,770

High Standard Mfg. Corp., Hamden, Conn.
- Slide, operating (carbine .30 cal.) 644,663

International Harvester Co., Detroit
- Dump trucks & tractor trucks 2,965,788
- Stake & platform trucks 2,290,745
- 37-passenger buses 1,765,653
- Utility vehicles (value not given) .....
- Commercial dump trucks 113,411
- Auto spare parts 732,517

International Spare Parts Corp., Long Island City, N. Y.
- Flywheels 127,688
- Rods; sleeve, shaft assembly spindle 141,999
- Adapter, arms, bolts, caps, clips 430,882

Jaques Power Saw Co., Denison, Tex.
- Cargo trailers 768,620

Kenworth Motor Truck Corp., Seattle
- Front axle cage, hub, knuckle 122,379
- Differential carrier 106,400
- Gages, carrier, bearing, elbow, carrier & cap assembly 398,870
- Universal joint, front axle assembly 421,382
- Auto parts & supplies 101,178

King-Seeley Corp., Ann Arbor, Mich.
- Renovation & conversion of mechanical time fuzes 876,000

Kropp Forge Co., Chicago
- Machine tools & equipment 1,314,280

Lamson & Sessions Co., Cleveland
- Bolts 377,021
- Auto spare parts 258,355

Libbey-Owens-Ford Glass Co., Toledo
- Periscopes & tooling 2,000,000

Long Mfg. Div., Borg-Warner Corp., Detroit
- Disks, engine clutch assembly 1,204,284
- Platens, press 178,982

Mack Mfg. Corp., Plainfield, N. J.
- Engine assembly 491,568
- Retainer, housing, bell, pipe, shim, carrier, etc. 120,126

ARMY ORDNANCE CONTRACTS ..*continued*

Mergenthaler Linotype Co., Brooklyn	
Range finders	$ 1,800,000
Midvale Co., Nicetown (Philadelphia)	
Forgings, tube alloy steel, 90mm guns	504,000
National Forge & Ordnance Co., Irvine, Pa.	
Tube forgings for guns	208,500
Forgings for 76mm guns	390,000
National Wholesalers, Inc., Los Angeles	
Regulators and kits	505,201
Fuel tanks	146,625
New Process Gear Co., Syracuse, N. Y.	
Transmission assembly	767,960
Transfer cases	114,000
Ohio Rubber Co., Willoughby, Ohio	
Strip-8 shoe, shoe assembly	8,378,265
Ohio Steel Foundry Co., Lima, Ohio	
Castings for breech ring for 90mm guns	468,272
Otis Elevator Co., New York	
Range finders	2,200,000
Pacific Car & Foundry Co., Renton, Wis.	
Gun motor carriages (value not given)	
Perfection Stove Co., Cleveland	
Power plant kits for trucks	881,570
Perrine Quality Products, Waltham, Mass.	
Batteries	812,120
Pullman-Standard Car Mfg. Co., Chicago	
New design railway boxcars	500,495
Reading Batteries, Inc., Reading, Pa.	
Batteries	2,509,049
Reflectone Corp., Stamford, Conn.	
Preproduction units of working model machine guns & spare parts	524,417
Remington Arms Co., Inc., Bridgeport, Conn.	
Primers, electric	602,854
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.	
Bolts	599,148
Nuts and screws	139,506
Republic Drill & Tool Co., Chicago	
Drills	523,706
Republic Steel Corp., Bolt & Nut Div., Cleveland	
Bolts	1,868,000
Misc. screws	105,296
Barrel blanks	256,318
Auto spare parts	309,272
Sessions Clock Co., Forestville, Conn.	
Head assembly for fuses	869,698
Superior Mfg. Co., Fitchburg, Mass.	
Rear sight assemblies for .30 cal. rifles	115,031
Pinions, elevated rear sights	525,000
Underwood Corp., New York	
Bolts (carbine .30 cal.)	610,196
United Battery Co., Los Angeles	
Batteries	588,400
United Motors Service Div., General Motors Corp.	
Batteries	709,920
Starter engines & parts	184,737
Generator regulators, repair kits	246,914
Auto parts & supplies	104,497
U. S. Rubber Co., Detroit	
Strip-8 shoe, shoe assembly	8,278,133
Joseph Weidenhoff & Co., Chicago	
Magneto & distributor testers	269,024
Tools & equipment	780,984
Westinghouse Electric Co., Detroit	
Misc. lamps	306,372
Wilcox & Gibbs Sewing Machine Co., New York	
Gun parts	526,990
Willard Storage Battery Co., Cleveland	
Batteries	3,276,818
Willys-Overland Motors, Inc., Toledo	
Utility trucks, ¼ ton	33,463,934
Cargo trucks, ¼ ton	266,303
Axle shafts	129,035
Engine assemblies	$ 5,665,700
Auto parts & supplies	971,687
Levers, bearings, caps	1,041,217
York Electric & Mach. Co., York, Pa.	
Modification of 75mm shells	400,600

ARMY SIGNAL CORPS

Barker & Williamson, Inc., Bristol, Pa.	
Radio sets, receivers, control units, dual diversity converters	6,130,122
Bendix Radio Div., Bendix Aviation Corp., Towson, Md.	
Radiosonde	3,911,013
Collins Radio Co., Cedar Rapids, Iowa	
Radio receivers	152,328
Diversity receiving equipment	152,257
Connecticut Telephone & Electric Corp., Meriden, Conn.	
Handsets	179,385
Continental Electronics Ltd., Brooklyn	
Radio teletype terminals	826,875
Empire Corp., Milwaukee	
Power units	1,290,548
Espey Mfg. Co., Inc., New York	
Transmitters, control units, mountings	2,855,400
Radio terminal sets	1,734,569
Radio relay and terminal sets	726,909
Modification kits	166,539
Federal Mfg. & Engrg. Corp., Brooklyn	
Radio receivers	557,517
Federal Telephone & Radio Corp., Clifton, N. J.	
Radio sets	8,000,000
Telegraph terminals	400,000
Garod Radio Corp., Brooklyn	
Controls	548,189
General Cable Corp., Philadelphia	
Telephone cable	653,973
General Dry Batteries, Inc., Lakewood, Ohio	
Batteries	1,904,354
General Electric Co., Syracuse, N. Y.	
Detector Sets	2,019,577
Radio sets	1,240,366
Electron tubes	268,800
VT fuses	150,000
Ceramic electron tubes	94,000,000
General Insulated Wire Works, Inc., Providence, R. I.	
Wire	798,832
Hallicrafters Co., Chicago	
Radio sets	6,091,530
Radio relay sets & test oscillators	124,707
Hubbell & Miller Co., Brooklyn	
Sound locating sets	530,743
Kellogg Switchboard & Supply Co., Chicago	
Relay racks	924,685
Telegraph terminals	422,591
Switchboard equipment	106,567
Telephone switchboards & maintenance parts	150,000
Lewyt Corp., Brooklyn, N. Y.	
Radio receivers, rectifiers, amplifiers, etc.	12,527,143
Radio sets	200,000
Lionel Corp., New York	
Headsets	879,750
Manufacturers' Batteries Co., Madison, Wis.	
Batteries	1,204,800
Molded Insulation Co., Philadelphia	
Radiosonde	1,900,110
Motoresearch Co., Racine, Wis.	
Power units	423,337
Motorola Inc., Chicago	
Radio sets	951,737
Okonite Co., Passaic, N. J.	
Wire	1,733,413
Cable	113,359

Olin Industries, Inc., Electrical Div., New Haven, Conn.
- Batteries ..... $ 2,027,294

Lowell Insulated Wire Div., Overlakes Corp., Lowell, Mass.
- Wire 936,224

Parish Pressed Steel Co., Reading, Pa.
- Reels 1,760,250

Phelps-Dodge Copper Products Corp., New York
- Wire 1,360,000

Plastic Wire & Cable Corp., Jewett City, Conn.
- Wire 1,778,476

Plastoid Corp., New York
- Wire 1,748,349

RCA Victor Div., Radio Corp. of America, Camden, N. J.
- Radio sets and parts 6,357,945
- Mobile television system, spare parts 192,871
- Radio receiver assembly, receiver monitors 134,942

RCA Service Co., Inc., Camden, N. J.
- Repair of Signal Corps radio sets 256,111

Rauland-Borg Corp., Chicago
- Power supply 3,196,635

Raytheon Mfg. Co., Waltham, Mass.
- Receivers, transmitters, amplifiers, tubes .. 3,501,662
- Radio sets 400,000
- Tubes, magnetron 216,045

Rex Corp., Cambridge, Mass.
- Wire 914,822

Siltronic Company, Pittsburgh
- Control boxes 671,384

Specialty Assembling & Packing Co., Inc., Brooklyn
- Public address sets, microphones, speakers 516,353
- Radio sets 588,109

Sperry Gyroscope Co., Great Neck, N. Y.
- Radar sets 4,000,000
- Electron tubes 242,356

Standard Cable Corp., Chickasha, Okla.
- Wire 2,932,000

Stromberg-Carlson Co., Rochester, N. Y.
- Multiple equipment 146,058

Telectro Industries, Long Island City, N. Y.
- Recorder-reproducers 489,871
- Auxiliary interphone equipment 192,853
- Electric outlet boxes 105,000

Telegraph Apparatus Co., Inc., Chicago
- Mountings 1,316,599
- Chest sets 283,480

Transmitter Equipment Mfg. Co., New York
- Radio terminal sets 1,050,075

National Carbon Div., Union Carbon & Carbide Corp., New York
- Batteries 1,707,000

U. S. Rubber Co., Bristol, R. I.
- Wire 2,913,420

U. S. Wire & Cable Corp., Newark, N. J.
- Wire 820,458

Utility Electronics, Corp., Newark, N. J.
- Radio sets 578,346
- Power supply 401,484

Western Electric Co., Inc., New York
- Telephone terminals & maintenance parts .. 1,222,000
- Parts for electrical directors & tooling 398,980
- Telephone equipment 287,652
- Radio sets 100,000
- Misc. other items 112,322

Whitney Blake Co., New Haven, Conn.
- Wire 842,929

ARMY QUARTERMASTER CORPS

Acme Steel Co., Chicago
- Seals, steel strapping 149,567
- Flat steel strapping 2,825,400

Brainard Steel Co., Warren, Ohio
- Seals, steel strapping 149,567
- Flat steel strapping 148,432

Cleveland Steel Barrel Co.
- Steel drums ..... $ 752,100

John Bean Div., Food Machinery & Chemical Corp., Lansing, Mich.
- Decontaminating apparatus, power driven .. 186,002

Bowser, Inc., Fort Wayne, Ind.
- Pumps, gasoline dispensing 172,050

Breese Burners, Inc. Santa Fe, N. M.
- Oil-burning tent stoves 801,843

C. L. Bryant Corp., Cleveland
- Yukon stoves with accessories 642,553

Cincinnati Coffin Co.
- Caskets, burial, metal seamless 1,339,080

Cleaver-Brooks Co., Milwaukee
- Mobile field bath units 1,134,960

Congo Engrg. Works, Mendota, Ill.
- Steel drums, flammable liquid 1,716,000

Doehler Metal Furniture Co., New York
- Desk quarters, flat top 537,046

Davey Compressor Co., Kent, Ohio
- Air compressors 801,588

R. G. LeTourneau, Inc., Peoria, Ill.
- Wire rope 153,920

Lonergan Mfg. Co., Albion, Mich.
- Oil-burning tent stoves 1,201,960

Masterfreeze Corp., Sturgeon Bay, Wis.
- Prefabricated sectional refrigerators 536,185

Nesco, Inc., Milwaukee
- 5-gal. water cans 2,649,981

Myers Drum Co., Oakland, Calif.
- Steel drums 659,000
- Flat steel strapping 2,079,606

Peters Dalton Inc., Detroit
- Dishwashing machines 717,033

Rheem Mfg. Co., Southgate, Calif.
- Drums, gasoline 1,341,000

Russakov Can Co., Chicago
- Steel drums, flammable liquid 1,454,375

Stanley Works, New Britain, Conn.
- Flat steel strapping 840,275

Talon, Inc., Meadville, Pa.
- Aluminum slide fasteners 2,670,000

U. S. Thermo Control Co., Minneapolis
- Portable refrigerators 208,206

ARMY CORPS OF ENGINEERS

Bay City Shovels, Inc., Bay City, Mich.
- Cranes 420,000

Caterpillar Tractor Co., Peoria, Ill.
- Tractors 1,251,942
- Bulldozers, tractors, power control units ... 672,080

Hyster Co., Portland, Ore.
- Tractors and cranes 590,439

R. G. LeTourneau, Peoria, Ill.
- Scrapers 651,000

Schield Bantam Co., Waverly, Iowa
- Crane shovels 951,115

Thew Shovel Co., Lorain, Ohio
- Crane shovels 676,844

NAVY BUREAU OF SHIPS

Air King Products Co., Brooklyn, N. Y.
- Wire recorders 600,000

Anaconda Wire & Cable Corp., Hastings, N. Y.
- Cable 440,857

Ansonia Electrical Co., Ansonia, Conn.
- Cable 1,300,000

Bath Iron Works, Bath, Maine
- Conversion of two destroyer escorts 2,000,000

Bendix Radio Div., Bendix Aviation Corp., Towson, Md.
- Direction finding equipment 350,000

Chrysler Corp., Detroit
- Aircraft cable 128,766

BUREAU OF SHIPS CONTRACTS . . . *continued*

Cleveland Diesel Engine Div., General Motors Corp.
- Conversion equipment kits ..... $ 500,000
- Diesel generator sets 400,000
- Vapor compressors 100,000

Federal Telephone & Radio Corp., Clifton, N. J.
- Radio receivers 800,000

Fleetwood Airflow, Inc., Wilkes-Barre, Pa.
- Storage cabinets 546,710

General Communications Co., Boston
- Test sets 1,000,000

General Electric Co., Schenectady, N. Y.
- Insulated stator rewind kits; rotor assemblies 100,000

Joy Mfg. Co., Pittsburgh
- Vaneaxial fans 438,718

National Co., Inc., Malden, Mass.
- Frequency shift keyers 450,000

Okonite-Callender Cable Co., Inc., Passaic, N. J.
- Cable assemblies 450,000

Packard Motor Car Co., Detroit
- Diesel engines and generator sets 4,000,000
- Prototype 600-hp 17-cylinder diesel engine .. 400,000

RCA Victor Div., Radio Corp. of America, Camden, N. J.
- Radio receivers 900,000

R. G. LeTourneau, Inc., Peoria, Ill.
- Mobile airplane crash cranes 100,000

St. Pierce Chain Corp., Worcester, Mass.
- Gears, vehicle 1,132,134

Teletype Corp., Chicago
- Teletypewriter equipment 1,050,000

Times Facsimile Corp., New York
- Frequency shift converters 100,000
- Facsimile transceivers 250,000
- Facsimile recorders 300,000

United States Hoffman Machinery Corp., New York
- Washing machines 609,403

NAVY ORDNANCE

Thomas A. Edison, Inc., West Orange, N. J.
- Servo motors 122,930

Electric Storage Battery Co., Philadelphia
- Torpedo propulsion batteries 1,231,400

Gary Steel Products Corp., Norfolk, Va.
- Spherical floats 121,500

General Electric Co., Schenectady, N. Y.
- Spare parts, Ordnane Supply System list ... 204,171

Heintz Mfg. Co., Philadelphia
- Establish development and pilot line facility for producing cold extrusions with Navy-owned German presses 325,000

Mullins Mfg. Corp., Salem, Ohio
- Development & production of steel 3-in. .70-cal cartridge cases by cold extrusion method 150,000

National Battery Co., Depew, N. Y.
- Torpedo propulsion batteries 631,989

Western Electric Co., New York
- Radar equipment vessel spares, target acquisition units, and vacuum tube spares .. 1,000,000

NAVY AVIATION

AiResearch Mfg. Co. Div., Garrett Corp., Los Angeles
- Cooler assembly for aircraft 163,620
- Turbines 116,700

Aluminum Corp. of America, Pittsburgh
- Sheets, aluminum alloy 107,919

Bendix Products Div., Bendix Aviation Corp., South Bend, Ind.
- Diaphragm assemblies ..... $ 393,162
- Carburetor assemblies 2,111,419
- Wheel brake and strut assemblies for aircraft 139,605
- Carburetor assembly for Pratt & Whitney engines 344,239
- Shock struts for aircraft 158,181

Cardox Corp., Chicago
- Kit assemblies 365,310

Champion Spark Plug Co., Toledo
- Spark plugs, aircraft engine 1,127,563

Chance-Vought Div., United Aircraft Corp., Dallas, Tex.
- Spare parts, maintenance for aircraft 858,148

Clary-Multiplier Corp., Los Angeles
- Services & material to depreserve, inspect, test, etc., government-owned aircraft bearings 500,000

Cleveland Pneumatic Tool Co., Cleveland
- Main shock struts for aircraft 324,019
- Strut assemblies 389,831
- Brace assemblies, for use on shock struts.. 121,249

Davey Compressor Co., Kent, Ohio
- Portable air compressor, gas-engine driven.. 392,236

Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, N. J.
- Automatic pilot components: servo No. 1.. 1,905,265
- Transmitters, fuel flow-meter 1,359,590
- Automatic engine controls for aircraft 122,810
- Boost control for Pratt & Whitney engines 230,238
- Alternators & excitor controls for aircraft.. 152,376

B. F. Goodrich Co., Akron, Ohio
- Wheel assembly for aircraft 112,444

Jack & Heintz Precision Industries, Inc., Cleveland
- Starters, aircraft, direct cranking 381,924
- Service & material to repair & convert starter assemblies 30,000

W. L. Maxson Corp., New York
- Servo unit assemblies for aircraft armament 799,539

Sperry Gyroscope Co., Div. of Sperry Corp., Great Neck, N. Y.
- Automatic pilot components for lighter-than-air ships 273,000

Scintilla Magneto Div., Bendix Aviation Corp., Sidney, N. Y.
- Magneto assembly for aircraft 114,863

Vickers, Inc., Div. of Sperry Corp., Detroit
- Pumps, hydraulic, for aircraft 267,720

Westinghouse Electric Corp., Philadelphia
- Relay assemblies, control panels, contractors, generators, regulators, for aircraft 456,774
- Torque tube assemblies 186,376

Wright Aeronautical Corp., Wood-Ridge, N. J.
- Services & material to operate government-owned aircraft engines 150,000

OTHER NAVY CONTRACTS

Aluminum Co. of America, Pittsburgh
- Aluminum, alloy plates, tubing & channels 180,885
- Aluminum tubing, aluminum plates 205,664

Allison Steel Mfg. Co., Phoenix, Ariz.
- Superstructure, parts, M4 bridge 2,360,139
- Special tooling for above 40,800

Amperex Electronic Corp., Brooklyn, N. Y.
- Electron tubes 412,500

Bay City Shovels, Inc., Bay City, Mich.
- Crawler cranes & equipment 300,500
- Spare parts 130,291

Bethlehem Steel Co., Bethlehem, Pa.
- Steel hull plates & steel marine boiler plates 1,000,000

Caterpillar Tractor Co., Peoria, Ill.
- Motor graders 232,419

Clark Equipment Co., Buchanan, Mich.
- Gasoline fork trucks ... $ 2,271,074
- Trucks & tractors ... 198,793
- Tractors, gasoline powered ... 158,423

Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, N. J.
- Generators and regulators ... 232,428

Electro-Motive Div., General Motors Corp.
- Repair parts for diesel engines ... 152,306

General Electric Co., Schenectady, N. Y.
- Repair parts for main propulsion turbines & auxiliary turbo generators ... 142,363
- Electron tubes ... 853,420

General Metals Corp., Enterprise Div., San Francisco
- Various repair parts for diesel engines ... 470,039

Cleveland Diesel Engine Div., General Motors Corp.
- Repair parts for diesel engines ... 1,753,348

Fairbanks, Morse & Co., Chicago
- Repair parts for diesel engines ... 642,120

Harrison Radiator Div., General Motors Corp., Lockport, N. Y.
- Repair parts for radiators & coolers ... 258,796

Kuthe Laboratories, Inc., Newark, N. J.
- Electron tubes ... 291,800

Logan Co., Louisville, Ky.
- Conveyors, gravity roller ... 582,478

Machlett Laboratories, Inc., Springdale, Conn.
- Electron tubes ... 627,000

Reynolds Metals Co., Louisville, Ky.
- Flat bar aluminum alloy ... 115,796
- Aluminum tubing, shape and extrusions ... 507,787
- Aluminum alloy sheets ... 167,144

Raytheon Mfg. Co., Waltham, Mass.
- Electron tubes ... 1,578,865

Sperry Gyroscope Div., Sperry Corp., Great Neck, L. I.
- Electron tubes ... 558,000

Stran Steel Div., Great Lakes Steel Corp.,
- Quonset huts ... 6,809,640
- Quonset warehouses ... 719,000

Sylvania Electric Products, Inc., Bayside, N. Y.
- Electron tubes ... 650,700

Worthington Pump & Machinery Corp., Harrison, N. J.
- Repair parts for pumps ... 103,449
- Repair parts for compressors & pump turbines ... 386,795

AIR FORCE

AC Spark Plug Div., General Motors Corp., Flint, Mich.
- Spark plugs ... 1,143,848

Allison Div., General Motors Corp., Indianapolis
- Spare parts for aircraft engines ... 710,000
- Additional spare parts for turbojets ... 6,989,448

Aeroproducts Div., General Motors Corp., Dayton
- Adaptation & fabrication of propellers ... 314,298

American Gas Accumulator Co., Elizabeth, N. J.
- Connector cable ... 814,046

Barden Corp., Danbury, Conn.
- Ball bearings ... 527,085

Beech Aircraft Corp., Wichita, Kans.
- Misc. assemblies, subassemblies, kits & spare parts for aircraft ... 200,000
- Tank assemblies ... 750,000
- Jettisonable fuel tanks ... 973,250
- Navigator observing domes ... 142,730

Bell Aircraft Co., Niagara Falls, N. Y.
- Misc. assemblies, subassemblies & spare parts for aircraft ... 675,000
- Reclamation of aircraft ... 280,000

Bell & Howell Co., Chicago
- Cameras, lenses, spare parts ... 1,040,153

Bendix Products Div., Bendix Aviation Corp., South Bend, Ind.
- Wheel & brake assemblies ... $ 5,012,099
- Brakes & related spare parts ... 229,099
- Master controls, fuel injection system ... 6,765,856
- Speed density metering units ... 117,997
- Carburetor spare parts ... 882,110
- Misc. spare parts ... 179,307

Bendix Radio Div., Bendix Aviation Corp., Towson, Md.
- Components of radio compasses ... 500,354

Biederman Motors Corp., Cincinnati
- Spare parts for compressors, tractors, generators ... 582,785

B. F. Goodrich Co., Akron, Ohio
- Misc. deicer shoes for aircraft ... 2,371,147
- Misc. fuel cells and deicer shoes ... 120,000
- Wheel assembly main landing; brake assembly duplex ... 2,281,150

Boeing Airplane Co., Seattle
- Acquisition, modification, insulation & repair of aircraft ... 700,000
- Spare parts for airplanes ... 887,222

Bowser, Inc., Fort Wayne, Ind.
- Fuel tank assemblies ... 1,721,780
- Meter assemblies ... 297,994

Canadian Commercial Corp. Montreal
- Spare parts for aircraft ... 2,778,827

Cessna Aircraft Co., Wichita, Kans
- Aircraft ... 1,445,000

Connecticut Telephone & Electric Co., Meriden
- Telephone systems ... 2,544,000
- Telephone central centers ... 1,200,000

Cook Electric Co., Chicago
- Wall type telephone distr. frames ... 124,562
- Recovery systems ... 275,000

Continental Motors Corp., Muskegon, Mich.
- Spare parts for aircraft engines ... 150,000

Cornelius Co., Minneapolis
- Air compressor assemblies ... 448,314

Crosley Div., Avco Mfg. Corp., Cincinnati
- Rack assemblies, electrically operated ... 1,143,000

Curtiss-Wright Propeller Div., Caldwell, N. J.
- Kit assemblies for airplane propellers ... 109,296
- Propellers & propeller spare parts ... 200,000

Dixon Mfg. Co., Inc., Coffeyville, Kans.
- Misc. assemblies, subassemblies, kits and spare parts ... 350,000
- Hydraulic jacks ... 395,783

Douglas Aircraft Co. Inc., Santa Monica, Calif.
- Spare parts for aircraft ... 19,185,558
- Model airplanes and spare parts ... 97,411,091
- Allocation for engineering changes for aircraft ... 2,686,250

Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, N. J.
- Indicators, vertical gyro ... 1,134,035
- Indicators, directional heading ... 377,928
- Indicators, hydraulic & oil pressure ... 326,772
- Indicators, fuel pressure ... 97,448
- Aircraft accelerometers ... 131,826
- Power amplifiers, compass signal ... 312,760
- Components of automatic pilots ... 361,157
- Boost controls ... 665,000
- Transmitters, fuel flow ... 147,836
- Transmitters, fuel pressure ... 128,511
- Transmitters, multipurpose ... 153,363
- Indicators, torque pressure ... 161,643
- Engine pressure instruments ... 433,109

Electric Storage Battery Co., Cleveland
- Batteries ... 675,576

Emerson Electric Co., St. Louis, Mo.
- Fans, air circulating ... 630,050

Fairchild Aircraft Div., Fairchild Engine & Airplane Corp., Hagerstown, Md.
- Misc. assemblies and subassemblies ... 5,051,382
- Kits for installation of oil tanks ... 136,316
- Modification of airplanes ... 500,000

AIR FORCE CONTRACTS ... continued

Firestone Tire & Rubber Co., Los Angeles
- B-29 fuel tanks ... $ 1,574,370
- Fuel cells for B-26 ... 179,685

Fletcher Aviation Corp., Pasadena, Calif.
- Jettisonable fuel tanks ... 1,007,350

General Electric Co., Schnectady, N. Y.
- Turbosuperchargers, regulators, & spare parts ... 10,423,401
- Spare parts for J47 turbojet engines ... 300,419
- Indicators, tachometer ... 179,663
- Regulators ... 128,865
- Special tools & test equipment & data ... 275,000
- Turbojet engines, spare parts, overhaul tools & data ... 6,610,961

Gilfillan Bros., Inc., Los Angeles
- Radar sets ... 5,795,180

Goodyear Tire & Rubber Co., Akron, Ohio
- Wheel and brake assemblies ... 3,205,043
- Maintenance parts for wheel & brake assemblies ... 196,156
- Fuel tanks, jettisonable ... 1,562,708
- Turbosuperchargers ... 829,800

Grand Central Aircraft Co., Glendale, Calif.
- Overhaul of aircraft engines ... 1,884,460

Hallicrafters Co., Chicago
- Radio receivers ... 1,492,046

Harris-Seybold Co., Cleveland
- Printing presses ... 602,539

Jack & Heintz Precision Industries, Inc., Cleveland
- Generators ... 1,011,000
- VA inverters ... 1,010,162
- Starters, direct cranking ... 177,350

Kollsman Instruments Div., Square D Co., Elmhurst, N. Y.
- Air speed indicators, pilot static, sensitive ... 371,359
- Indicators, rate of climb ... 165,165
- Indicators, electric tachometer ... 85,827
- Multipurpose indicators ... 88,149

Lear, Inc., Grand Rapids, Mich.
- Automatic pilots, components ... 5,783,756
- Actuator assemblies and screw jacks ... 280,738

Lockheed Aircraft Corp., Burbank, Calif.
- Misc. spare parts for aircraft ... 9,027,427
- Retrofit kits ... 1,000,000
- Misc. assemblies & subassemblies of aircraft ... 100,000
- Mid-span wing pylon kits ... 100,000

Lockheed Aircraft Service, Inc., Burbank, Calif.
- Modernization of aircraft ... 2,000,000

Lycoming-Spencer Div., Avco Mfg. Corp., Williamsport, Pa.
- Aircraft powerplants ... 13,568,360
- Spare parts for engines ... 1,885,974

Marlin-Rockwell Corp., Jamestown, N. Y.
- Ball bearings ... 719,408
- Roller bearings ... 272,300

Minneapolis-Honeywell Regulator Co., Minneapolis
- Components for automatic pilots ... 391,958
- Turbosupercharger regulator systems ... 621,689
- Gyro controls, calibrators and brackets ... 245,350

North American Aviation, Inc., Los Angeles
- Misc. assemblies, subassemblies, kits & spare parts for aircraft ... 25,080,736
- Engineering funds for F86E spare parts ... 500,000
- Modification of aircraft; manufacture of modification kits ... 226,590
- Modification kits for airplanes ... 200,817
- Airplanes and related equipment ... 64,337,847
- Spare parts for aircraft ... 1,510,450

Pratt & Whitney Aircraft, E. Hartford, Conn.
- Turbojet development ... 3,300,000
- Turbojet engines ... 4,650,000

Radioplane Co., Van Nuys, Calif.
- Target aircraft spares ... 3,632,370

Ranger Aircraft Div., Fairchild Engine & Airplane Corp., Farmingdale, L. I., N. Y.
- Electric power plant aircraft accessories ... $ 1,227,000

Republic Aviation Corp., Farmingdale, L. I., N. Y.
- Misc. assemblies and subassemblies, kits and spare parts ... 4,693,512
- F-84E airplanes ... 7,500,000
- F-84E-5 RE model airplanes, spare parts ... 47,674,526
- F-84F airplanes, spare parts ... 34,900,000
- RF-84F airplanes ... 3,200,000
- Spare parts for airplanes ... 997,095

Rhodes Lewis Co., Culver City, Calif.
- Chargers, 20mm automatic, modify feeder slides ... 2,473,894

Ryan Aeronautical Co., San Diego
- Misc. assemblies, subassemblies, and spare parts for aircraft ... 339,000
- Spare parts for aircraft ... 375,558

Schwien Engrg. Co., Los Angeles
- Modification of government-owned gyros ... 106,250
- Vertical gyro indicators ... 117,900
- Electric indicators, turn and bank ... 137,940

Scintilla Magneto Div., Bendix Aviation Corp., Sidney, N. Y.
- Overhaul & maintenance, spare parts & subassemblies for ignition equipment ... 274,705
- Exciter units, dynamotor and filter units ... 306,897

Sikorsky Aircraft Div., United Aircraft Corp., Bridgeport, Conn.
- Spare parts for aircraft ... 277,000
- Misc. assemblies, subassemblies, & spare parts for maintenance and overhaul of aircraft transmission systems ... 200,000

Solar Aircraft Co., San Diego
- Machinery and equipment ... 575,000

Sperry Gyroscope Div., Sperry Corp., Great Neck, N. Y.
- Compass components ... 2,850,585
- Electron tubes ... 151,230
- Automatic pilot parts & tools ... 846,423
- Generators ... 149,716
- Components of slaved gyro magnetic compass ... 2,291,659
- Gyro compass componets ... 1,631,444
- Components of type E-6 automatic pilot ... 1,124,154
- Engine analyzer ... 1,080,400

Steel Products Engrg. Co., Springfield, Ohio
- Hoist assemblies, electric bomb loading ... 548,884

Sundstrand Machine Tool Co., Rockford, Ill.
- Spare parts and/or sub assemblies for constant speed drives ... 427,574
- Alternator drives ... 3,139,054

Sylvania Electric Products, Buffalo, N. Y.
- Radio transmitters, power junction boxes ... 2,473,200

Texas Engrg. & Mfg. Co., Dallas
- Reconditioning of aircraft ... 200,000
- Fabrication & erection of maintenance docks ... 586,008

Titeflex, Inc., Newark, N. J.
- High tension ignition harnesses ... 2,534,280

U. S. Gage Div., American Machine & Metals Inc., Sellersville, Pa.
- Transmitters, torque pressure ... 103,517
- Transmitters, hydraulic pressure ... 255,295
- Transmitters, oil pressure ... 327,109

Vic Patushin Industries, Inc., Los Angeles
- Tank assemblies ... 1,394,250

Westinghouse Electric Corp., Dayton, Ohio
- Generators ... 995,917
- Alternator assemblies ... 217,800
- Voltage regulators, alternator assemblies ... 193,065

Wright Aeronautical Corp., Curtiss-Wright Corp., Wood-Ridge, N. J.
- Spare parts for aircraft engines ... 16,855,892
- Reconditioning cylinder assemblies ... 5,800,613
- Modification parts for engines ... 3,854,605

AMERICAN MACHINIST 1951 PRODUCTION PREVIEW

a review of new metalworking equipment, parts, and materials

Here — in concise, classified form — are 1500 new products of interest to the metalworking industries. It is the 38th annual review of the equipment described in the pages of American Machinist during the preceding year. It provides, in handy reference form, a guide to help you meet the production problems of 1951

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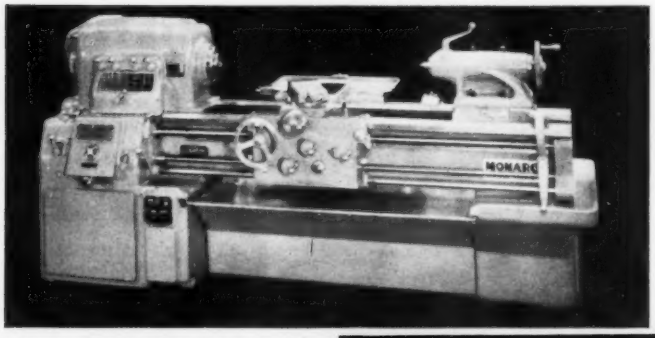
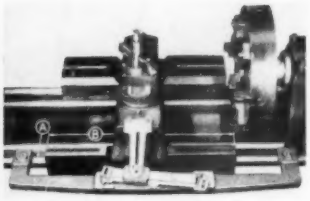
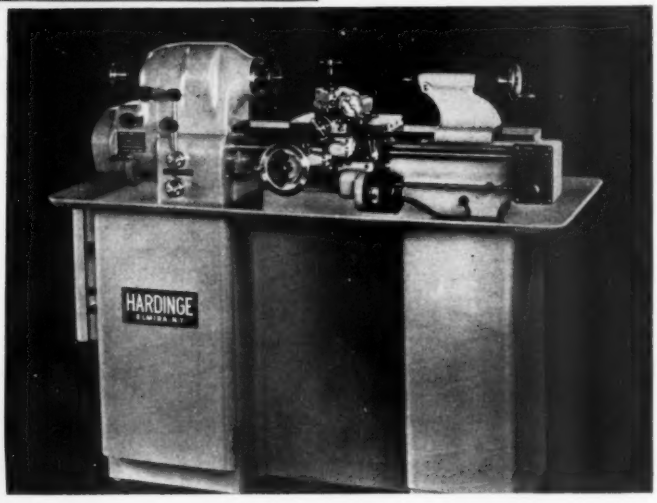


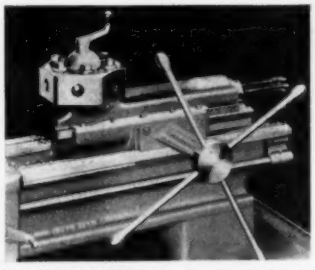
LATHES—*Monarch Machine Tool Co., Sidney, Ohio.* Series 60 line of engine and toolmaker's lathes have the headstock gears of helical form and made of hardened-alloy steel with ground or shaved tooth contours. Due to the extra width of the gear teeth more tooth contact than normally possible is obtained.



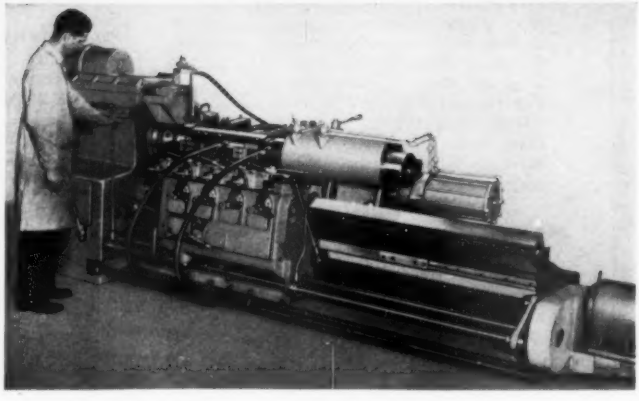
LATHE ATTACHMENT — *Master Taper Co., 4531 N. Beacon St., Chicago 40, Ill.* This heavy-duty taper attachment is suitable for lathes having a swing up to 36 in. It will cut a 12-in.-long taper of 20° (4 ipf approx.) at one setting.



LATHE—*Hardinge Brothers, Inc., Elmira, N. Y.* The carriage of this model HL is made from one solid rectangular casting, machined all over, and fitted directly to the dovetail bedways. This construction is to give the cross-slide the proper foundation to withstand high speeds, heavy cuts, and to retain original machine accuracy. →

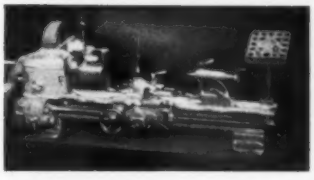


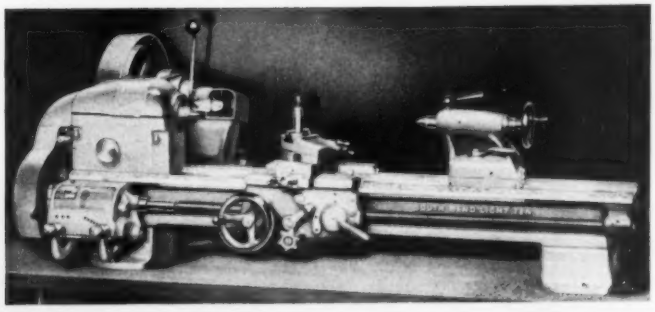
BED TURRET—*South Bend Lathe Works, South Bend 22, Ind.* Hand-feed bed turret is so designed that it can be fitted to the inside bed ways of any 16-in.-swing South Bend lathe. The turret can be removed at any time, and the tailstock remounted for regular lathe work.



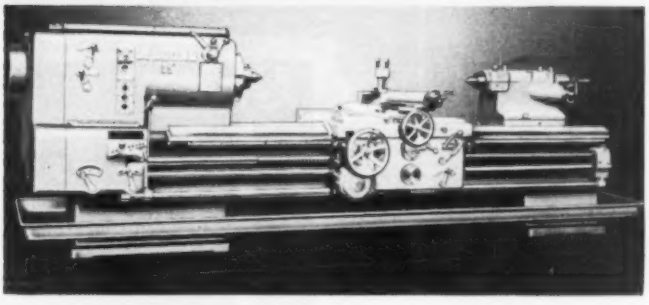
LATHE—*The Seneca Falls Machine Co., Seneca Falls, N. Y.* The model "LS" Lo-swing lathe is reported to provide great versatility and ease of change-over. The front turning carriage may be equipped with two or more individually controlled, power-operated cross-slides which feed the tools into the cut. →

BENCH LATHE—*South Bend Lathe Works, South Bend 22, Indiana.* The quick-change gear box on the Model A Light Ten Lathe provides 48 thread-cutting feeds, power-longitudinal feeds, or power crossfeeds. The lathes are available in 3-, 3½-, 4- and 4½-ft bed lengths. →



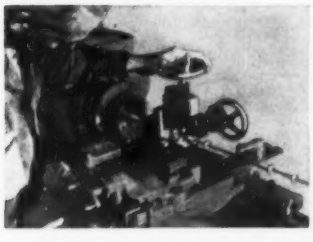


TOOLROOM LATHE—*South Bend Lathe Works, South Bend 22, Ind.* Known as the Light Ten, these lathes take work up to 10-in. diameter over the bed. Large handwheels, micrometer-graduated feed collars, and convenient controls are claimed to reduce operator fatigue.

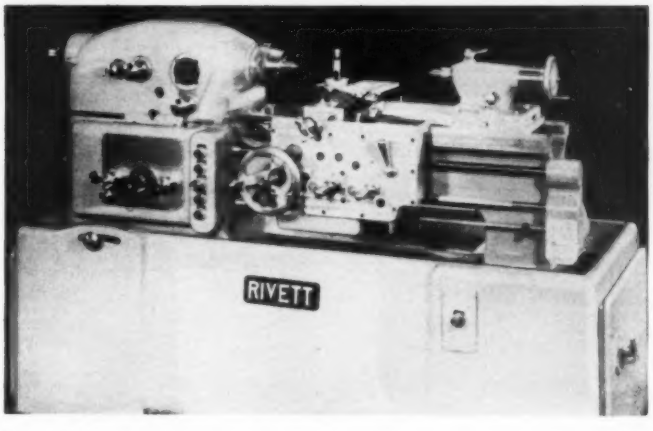


LATHE—*The R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.* Called "1950 Series," this 25-in. lathe boasts a 30½-in. swing capacity, 32 spindle speeds ranging from 5 to 602 rpm, and four-directional power rapid traverse. →

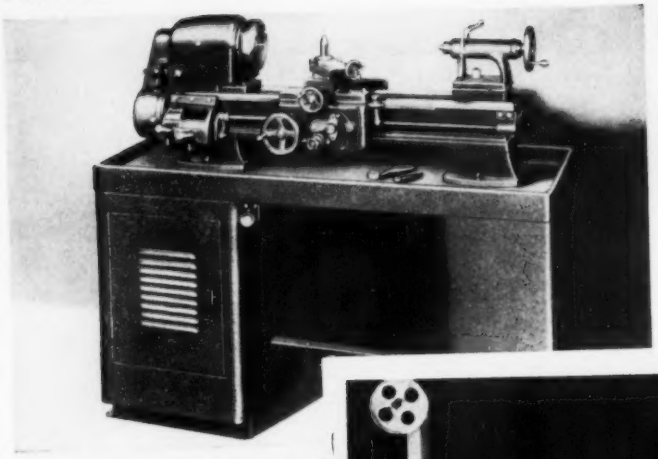
LATHES—*American Steel Foundries, King Machine Tool Div., Cincinnati 29, Ohio.* Bed lengths for the Sebastian 20-in. lathe, both general purpose and gap types, are available up to 20 ft. Equipped with 8-speed geared heads with Timken tapered bearings on headstock shafts, and Timken precision bearings on the spindle. →



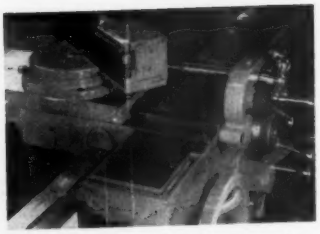
SCREW-MACHINE ATTACHMENT—*Contract Div., The Todd Co., Rochester, N. Y.* The Karge Turnomat is a precision lathe and screw-machine attachment for automatic turning to extremely close tolerances. Primarily for extremely slender turning of either shafts or tubing.



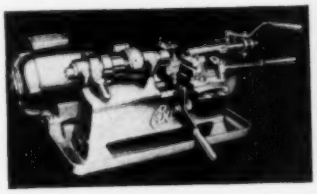
TOOLROOM LATHE—*Rivett Lathe & Grinder, Inc., Brighton, 35, Boston, Mass.* Recommended for both sensitive instrument work and heavy carbide cutting, the Model 1020 S. has been constructed to handle any toolroom turning within its 12½-in. swing and 20-in. centers. →



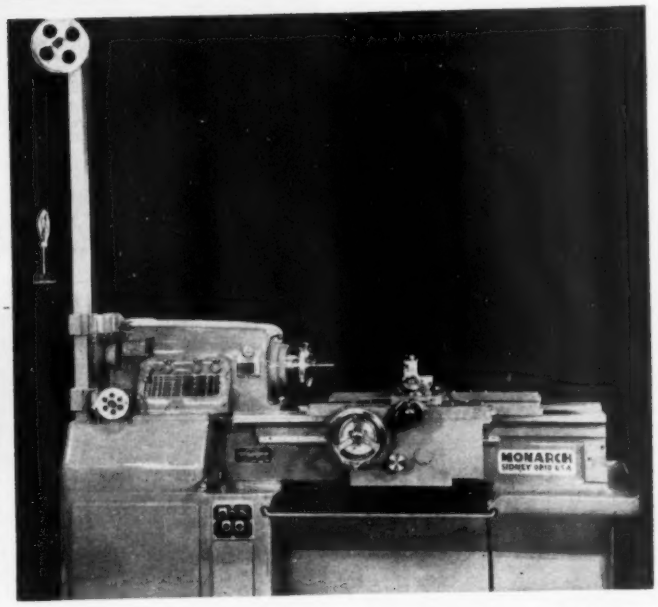
11-IN. LATHE—*Logan Engineering Co., 4901 West Lawrence Ave., Chicago 30, Ill.* With 1-in. collet capacity, 11-in. swing, and 1⅜-in. spindle hole, these lathes are built in two models, No. 955 with 24-in. center distance, and No. 957 with 36-in. center distance. Ball-bearing-mounted spindles permit speeds of 45 to 1500 rpm without bearing adjustment.



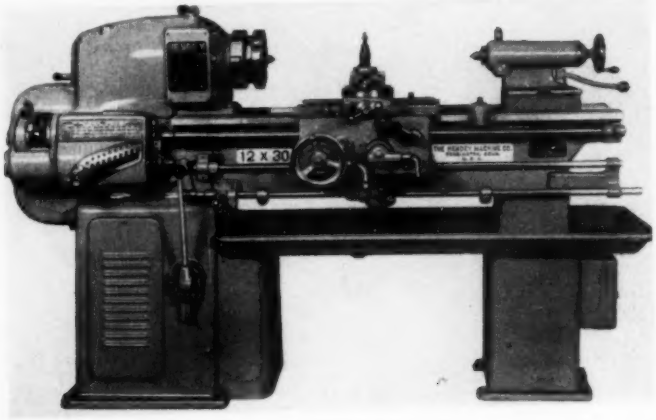
BALL-TURNING REST—*The Monarch Machine Tool Co., Sidney, Ohio.* With this ball-turning rest a 4-in. ball can be turned on the 14-in. Monarch Series 60 engine lathe, a 5¾-in. ball on the 16-in. machine, and a 6-in. ball on the 20-in. unit.



BENCH LATHE—*DCMT Sales Corp., 164 Duane St., New York 13, N. Y.* The collet attachment, tailstock, and compound slide on this bench lathe are lever-operated. The front and rear tool holders are adjustable for height.

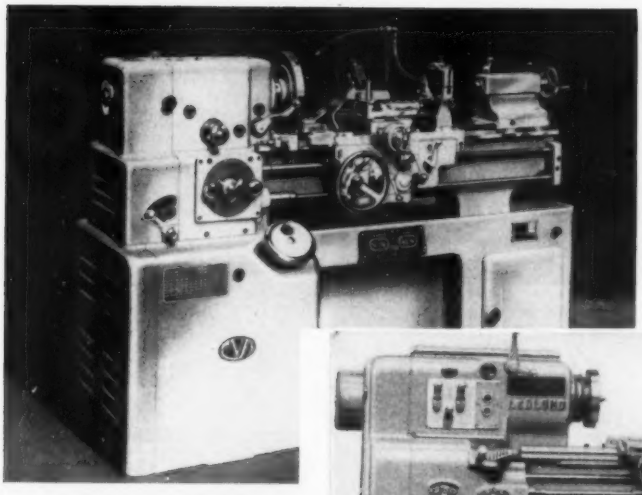


LATHE—*The Monarch Machine Tool Co., Sidney, Ohio.* Lathe for testing the machinability of steel, is based upon finding that when a given pressure is applied to the tool, steels of different machining quality cut at different rates. This machine differs in: First, the tool carriage is disconnected from the fixed-feed mechanism and is mounted on anti-friction bearings. Secondly, it is designed to apply a predetermined tool pressure. Thirdly, a mechanical counter records the number of spindle revolutions and measures tool travel.



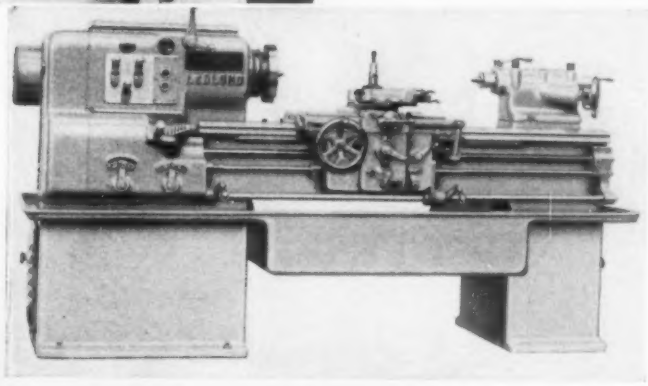
GENERAL-PURPOSE LATHE—*The Hendey Machine Co., Torrington, Conn.* Lathe, No. 1, replaces the old 12- and 14-in. tie-bar cone-head lathes. It is available in sizes 12x30, 12x42 and 12x54 in. All sizes have a maximum swing over the ways of 14½ in.

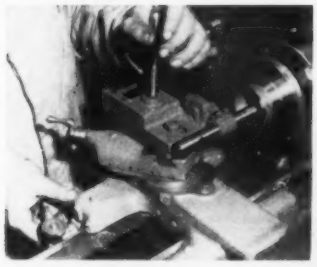
←



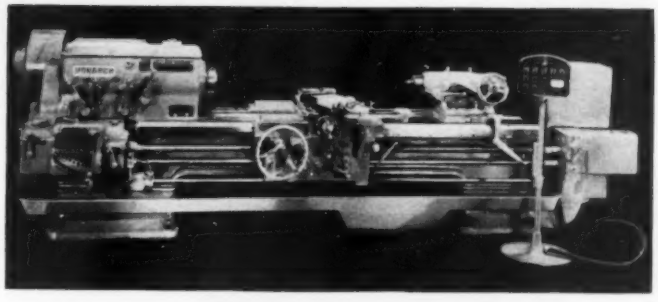
TOOLROOM LATHE — *DCMT Sales Corp., 164 Duane St., New York 13, N. Y.* The bed of the No. 1A has a deep cross-section cast in semisteel. The ways are flame-hardened and precision ground. The spindle register for chucks is of conical form, attachments being secured by three quick-release cams.

ENGINE LATHE—*R. K. LeBlond Machine Tool Co., Cincinnati, Ohio.* Lathes of 12-, 14-, and 16-in. swing size with 24 spindle speeds, and 20-in. size with 32 spindle speeds are included in this heavy-duty engine-lathe line. The two smaller units offer 1250 rpm max. and use 7½ hp 1800 rpm motor; the 16-in. unit employs a 10- or 15-hp 1800-rpm motor; and the 20-in. machine, a 15- or 20-hp 1200-rpm motor.



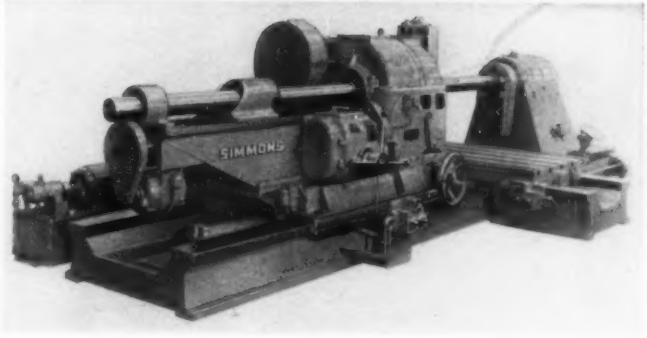


THREAD CHASING ATTACHMENT —*The Motch & Merryweather Machinery Co., 715 Penton Building, Cleveland 13, Ohio.* The Meritool automatically retracts the lathe tool from work at any desired setting, simplifying chasing of precision threads.

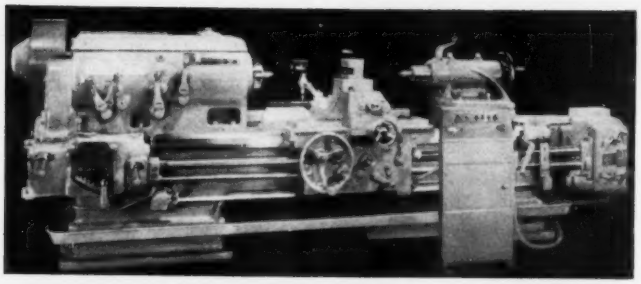


ENGINE LATHES—*The Monarch Machine Tool Co., Sidney, Ohio.* The Motor Trace is a motor-powered electrically operated duplicating device which converts any Monarch engine lathe, 14 in. and up, into an automatic-cycle unit for producing small lots of two or three pieces with the economy of long production runs.

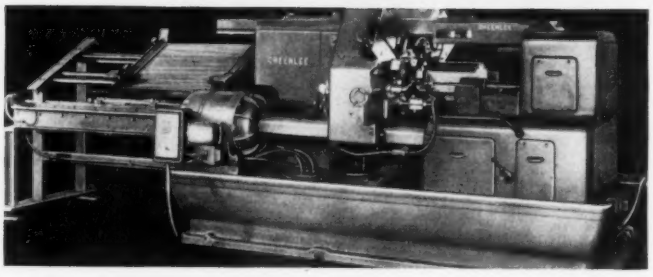
JEWELER'S LATHE—*Louis Levin & Son, Inc., 782 E. Pico Blvd., Los Angeles 21, Calif.* Mounted on a bench with a motor drive. Made with either 3/16- or 5/16-in. collet capacity.



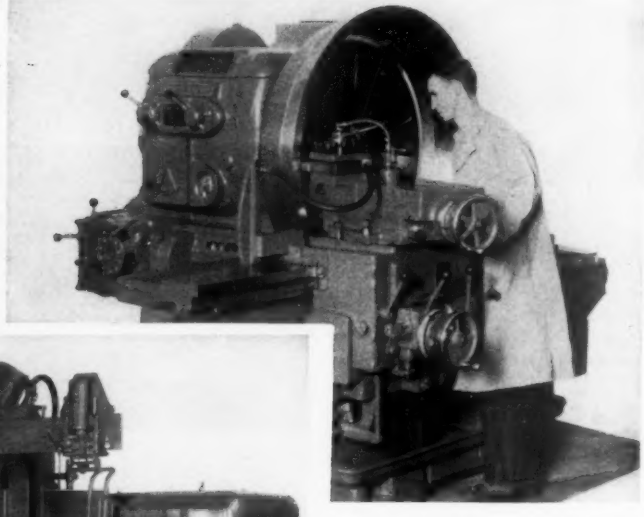
FACING MACHINE — *Simmons Machine Tool Corp., Albany, N. Y.* Both the bar feed in the head and the entire boring and facing unit of this 6-in.-bar horizontal machine moves hydraulically along the bed. A continuous-feed facing head eliminates the star feed.



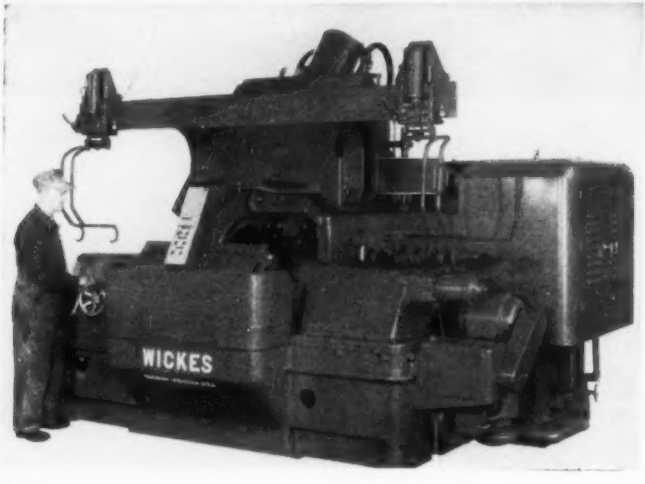
←TEMPLET-CONTROLLED LATHE—*Monarch Machine Tool Co., Sidney, Ohio.* Model N and Model NN roll-turning lathes for contour turning of steel mill rolls up to 15- and 20-in. dia respectively are small scale adaptations of the "Monarch Heavy-Duty Roll Turner" (*AM*—June 2, '49, p134). Both machines have Keller controls.



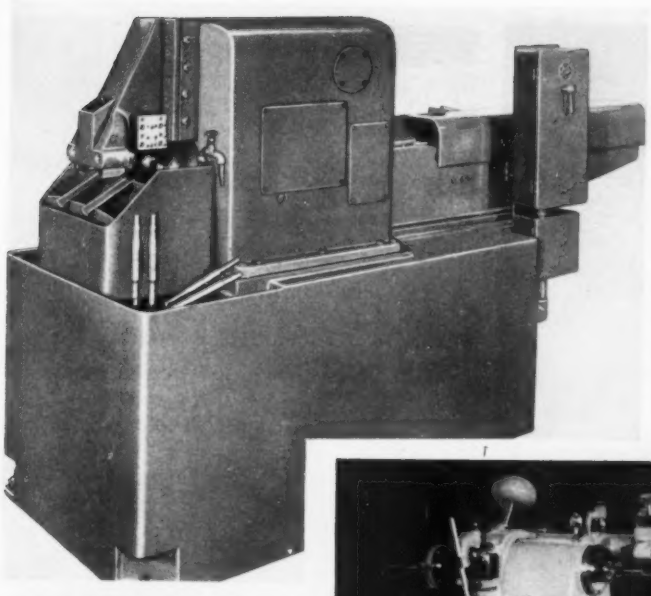
←AUTOMATIC MACHINE — *Greenlee Bros. & Co., Rockford, Ill.* This 1⅝-in. six-spindle screw machine is adapted for handling pre-cut bar and tubular stock in lengths from 30 to 60 in. It permits turning operations on the back end of the stock.



AUTOMATIC LATHE—*Wickes Brothers, Saginaw, Mich.* Center-drive model; designed for rough and finish turning of all crankshaft main-line bearing and ends. It uses three sets of cross-slides which surround the crankshaft with cutting tools. ↓

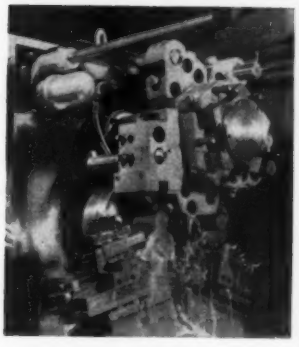


CHUCKING LATHE — *The Lodge & Shipley Co., 3055 Colerain Ave., Cincinnati 25, Ohio.* The right-angle chucking lathe was developed for facing, turning, and boring thin-walled work of large diameter and short length. It is claimed that using a bed in the shape of a T displaces cumbersome straight-line lathes for this class of work.

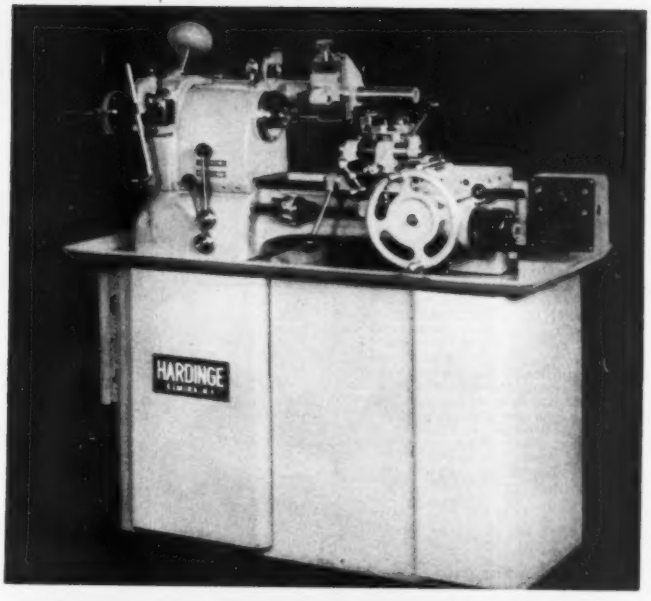


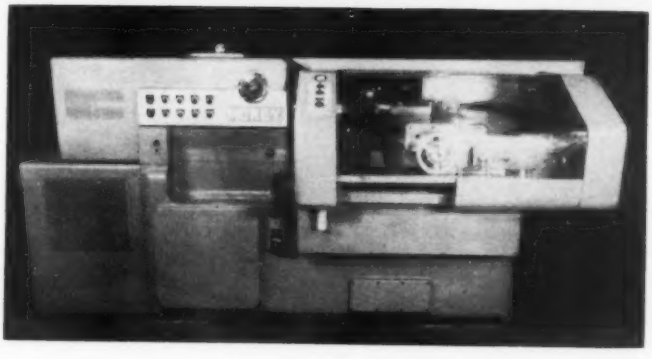
←
AUTOMATIC—*The Motch & Merryweather Machinery Co., 715 Penton Bldg., Cleveland 13, Ohio.* Forming operations of external grooves and shapes as well as various end operations can be performed on tubular or solid stock on this automatic machine. Heavy-duty toolslides carry the tools, advancing and retracting automatically by positive-cam operation.

CHUCKING MACHINE — *Hardinge Brothers, Inc., Elmira, N. Y.* Developed to fill the gap between second-operation machine and the large turret lathes, this chucking machine turns, bores, or threads to completion, such parts as turret-lathe or screw-machine blanks. Parts up to 6-in. dia can be handled with accuracy. ↓



SINGLE-SPINDLE AUTOMATICS — *The Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.* Two optional arrangements are offered in these single-spindle automatics that are said to broaden the threading performance. One of these provides an intermediate-slip, reversing main-drive motor, so solid taps or die heads may be used as well as the self-opening type.





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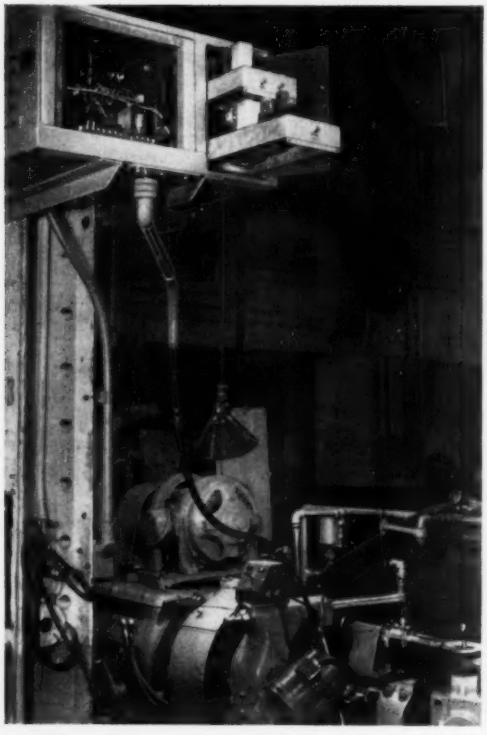
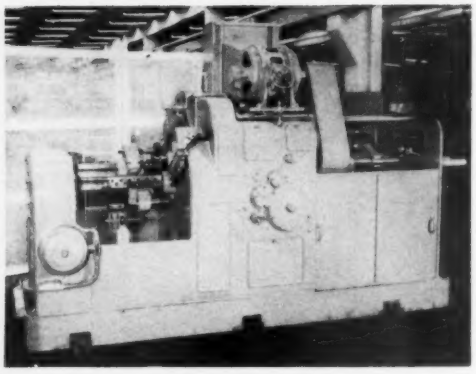
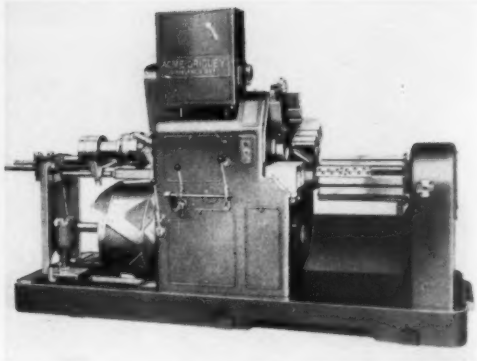
AUTOMATIC LATHE — *Morey Machinery Co., Inc., 410 Broome St., New York 13, N. Y.* All moving parts on the Model CD automatic lathe are completely inclosed by a Plexiglas coolant guard. To insure operator safety and to cut production time, closing of the shield is included as part of the automatic cycle. The basic machine consists of bed, headstock, and power unit, and a choice of three different toolslides is provided to suit specific requirements.

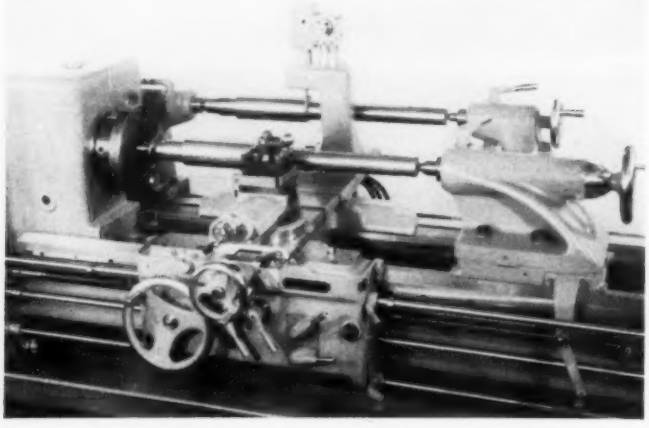


ELECTRONIC DUPLICATOR—*Manufactured by Raytheon Manufacturing Co., Waltham 5½, Mass., distributed by Voss Engineering Co., 1800 Sarah St., Pittsburgh, Pa.* A duplicator that operates by varying the strength of a magnetic field has been developed. Primary advantage of the duplicator lies in its ability to provide a smooth control over very slight changes in contour combined with the ability to make abrupt changes in contour, without overshooting.



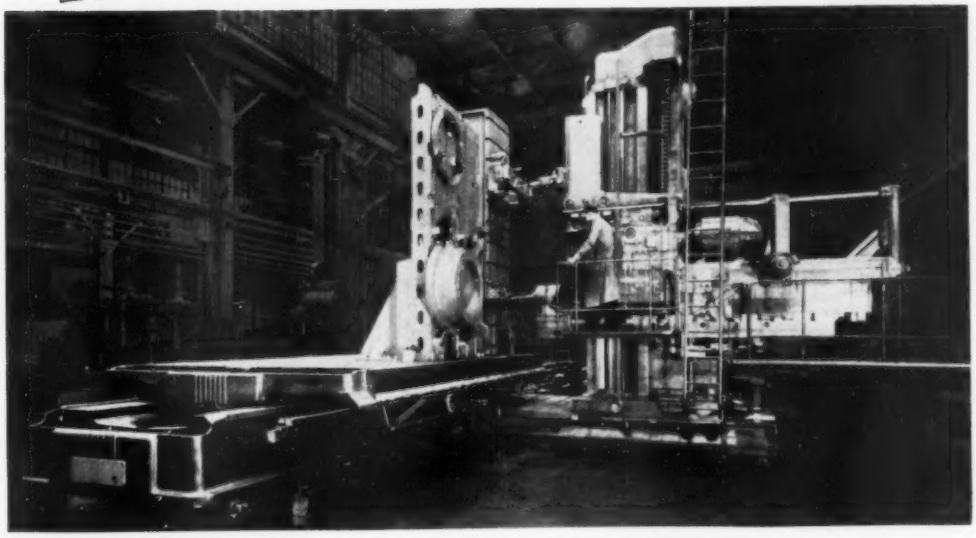


SINGLE-SPINDLE BAR MACHINE —*The National Acme Co., 170 E. 131 St., Cleveland 8, Ohio.* The large open-tooling zone of the Model M single-spindle automatic contains three cross-slides. The open zone provides ease of operation and set-up from both sides—no interferences with any mechanical shaft. Spindle-speed change gears and three automatically controlled range gears provide a wide spindle-speed range; 2⅝ in., 150 to 1550 rpm.; 3½ in., 120 to 1220 rpm.



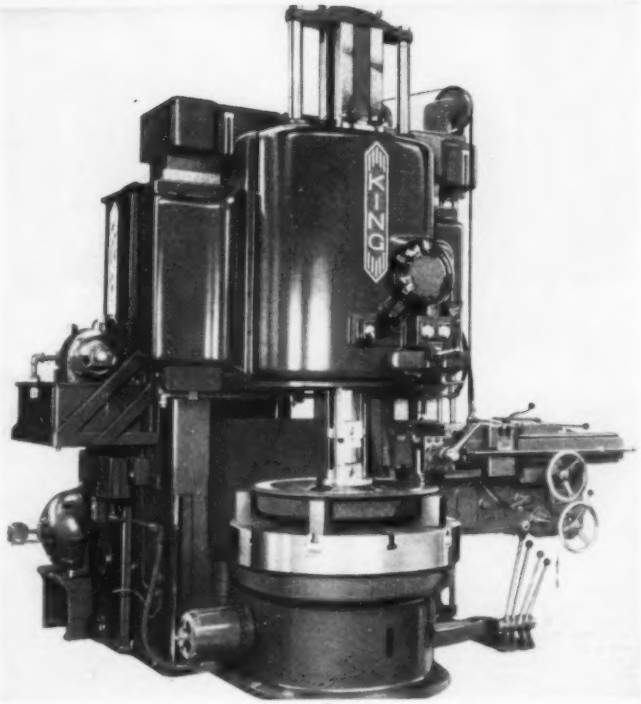
FLUID TRACER — *The Sidney Machine Tool Co., Sidney, Ohio.* Applied to standard lathes the Fluid Tracer serves the dual purpose of tracing from a master and handling regular lathe work. It does not limit the capacity of either, eliminating the necessity of having a single-purpose machine.

Boring



HORIZ. BORER—*Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* Addition of two structural features to a planer-type horizontal boring, drilling and milling machine has expanded the working range and capacity. By adding tracer control to the machine, together with a power-operated underarm ram and spindle support, it performs a range of operations which would ordinarily require several special machines to complete.

POSITIONING DEVICE — *Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* This device consists of two complete control units, one for lateral setting of table on the saddle, and the other for vertical setting of the headstock on the machine column. They may be operated individually or simultaneously, depending upon the requirements of the job.



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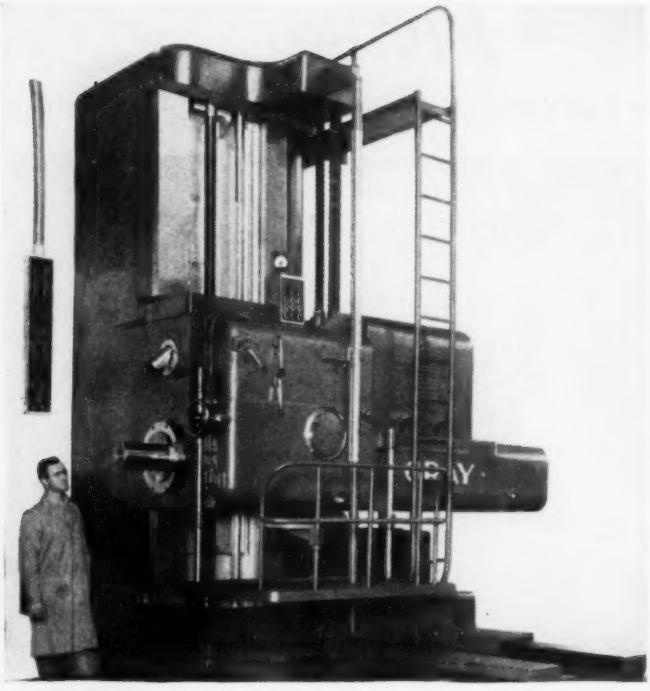
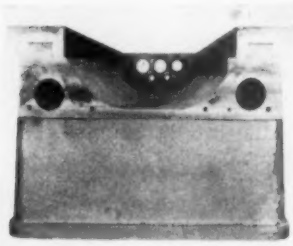
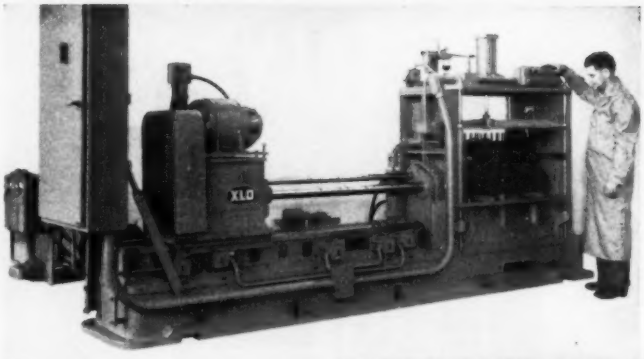
BORER—*American Steel Foundries, King Machine Tool Div., Cincinnati 29, Ohio.* Locomotive wheels are bored and faced on this machine. Ram cycle is fully automatic and can be set to rapid traverse to work, rough bore at one feed, finish bore at another feed, form a radius at another feed, then dwell and rapid traverse out of the work.

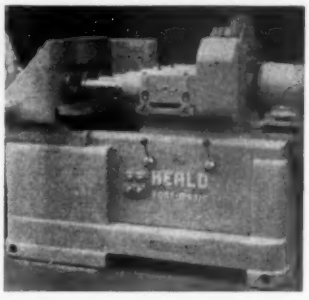


HORIZONTAL-BORING MACHINES —*The Gray Co., 3611 Woodburn Ave., Cincinnati 7, Ohio.* Models of these horizontal boring, drilling, and milling machines are being produced in the 7- and 8-in. floor-type. Spindle motors of 50 to 100 hp are designed to utilize heavy-duty carbide milling cutters working at maximum capacity. ←



HORIZONTAL-BORING MACHINES —*Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* Heavy-duty, surface-hardened ways are available on the horizontal boring, drilling, and milling machine. This structural feature is claimed to insure continuous machining accuracy over extended periods of time.

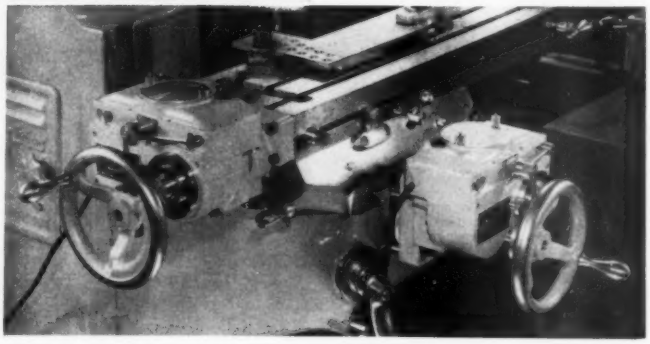




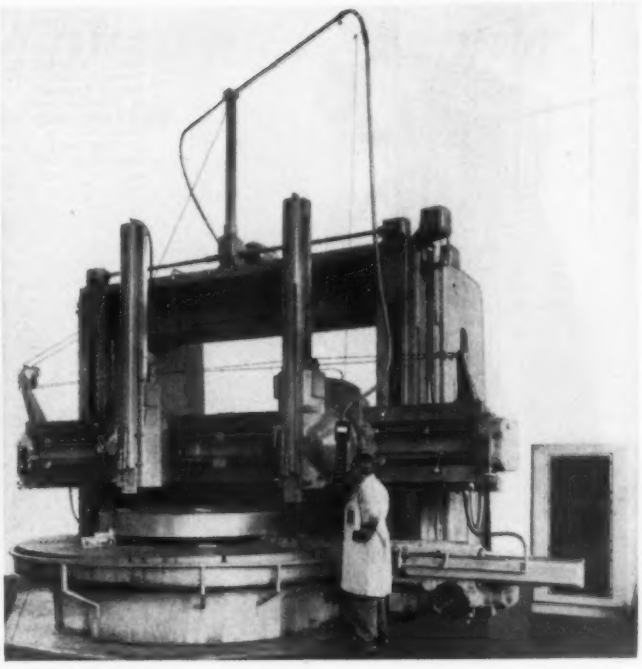
BORING MACHINES — *The Heald Machine Co., Worcester, Mass.* Models 425 and 426 end-loading BoreMatics differ from earlier models in that fixture and work are mounted on the bridge while the boring heads and loaders are located on the machine table.

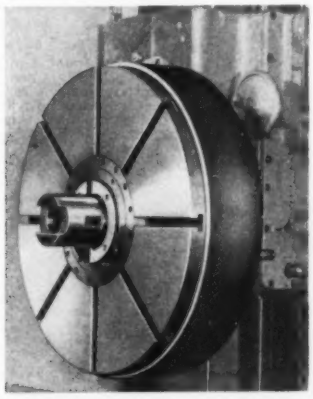
LINE-BORING MACHINE — *Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 32, Mich.* Finishes crankshaft and camshaft bearings in engine blocks simultaneously. The operator pushes the blocks in to the fixture, touches the cycle button, then removes the blocks at the completion of the cycle.

TABLE POSITIONER — *Benzon Machine Co., 7th and Washington Ave., Lansdale, Pa.* Desired positions are first cut and checked on Micro-Patterns in a recording unit. These patterns are transferred to the Coordinator on the machine where light signals indicate proper traverse. →



BORING MILL — *Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* Elimination of mechanical shift levers from the front and side of this 12-ft vertical boring and turning mill simplifies operations. Control functions are handled through a pendant station and solenoid that activates a hydraulic shift mechanism. →



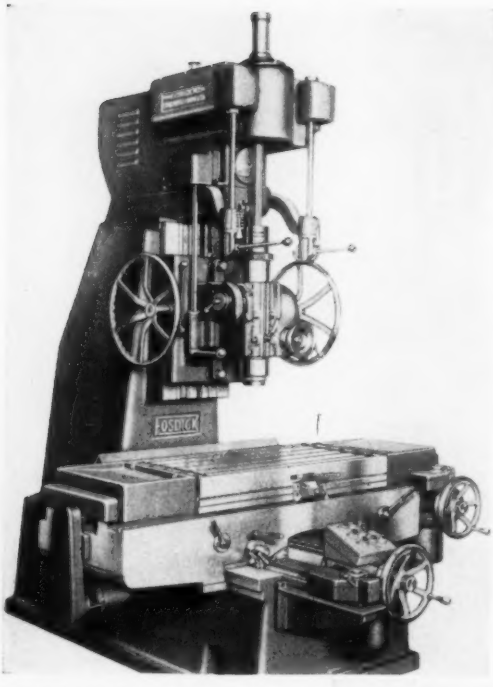


FACEPLATE DRIVE — *Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* Tools, tool heads and special tooling setups can be rigidly mounted on this faceplate, or it may be employed for holding and roating the workpiece while tools are mounted on the machine table. For G & L horizontal boring, drilling and milling machines.

CAR-WHEEL BORING TOOL—*Davis Boring Tool Div., Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* Railroad-car-wheel boring tools equipped with blades of solid tungsten carbide. Four cutters are used in rough boring, two in finish boring, and a single cutter for chamfering.

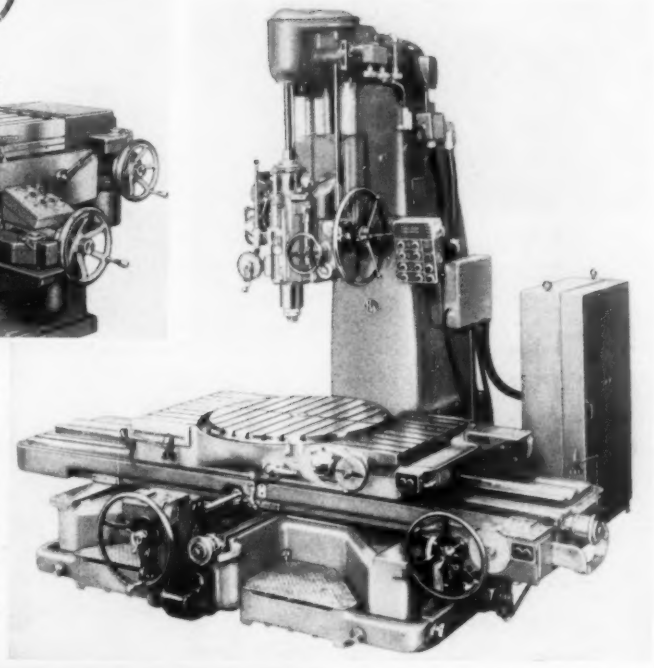
REVOLVING TABLE—*The Ohio Machine Tool Co., Canton, Ohio.* This 84 x 96-in. table incorporates hydraulic raising device and clamps, and is graduated in ½°. Finished pads on the table base are provided for locating the table against blocks placed in machine table T-slots.

JIG BORER—*Hauser Machine Tool Corp., 30 Park Ave., Manhasset, N. Y.* Designated as the Type 5, this jig borer is the result of the demands of industry for a machine of larger capacity. The maximum boring capacity is 9 in. and vertical travel of the boring spindle is the same. →



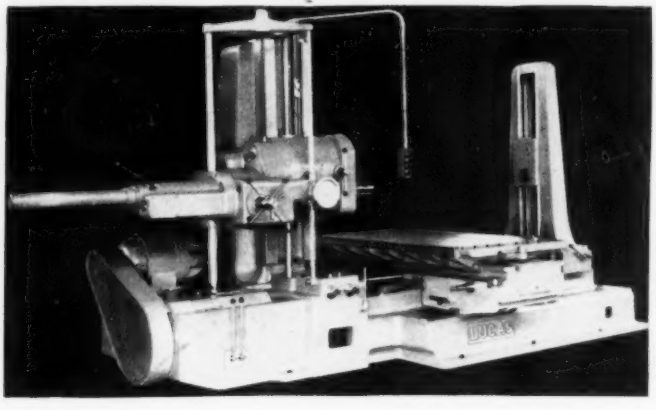
JIG BORER—*Fosdick Machine Tool Co., Blue Rock and Apple St., Cincinnati 23, Ohio.* Time required to obtain setting of the table on a jig borer has been reduced by the automatic positioning incorporated in the No. 42P. Rapid traverse to both table and slide is automatically engaged when using the positioning device. Both table and slide can be automatically positioned at the same time, cutting the time needed in half.

JIG BORER—*Pratt & Whitney, Div. Niles-Bement-Pond Co., Hartford, Conn.* Worktable of the 4E jig borer provides a large rectangular work area as well as a precision built-in rotary table for circular indexing and polar co-ordinate work.



ANGLE PLATES—*Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* Designed to insure maximum rigidity and ease of setup, these angle plates provide a solid support to hold the work during machining. They permit positioning work at right angles or parallel to the machine-spindle axis.

HORIZONTAL BORING MACHINE—*The New Britain Machine Co., Lucas Machine Div., Cleveland, Ohio.* The bed of the Model 42 B-60 4-in. machine has been extended to support the motor and speed and feed gearboxes. Feed-unit selecting levers indicating direction of feed and feeds can be combined.

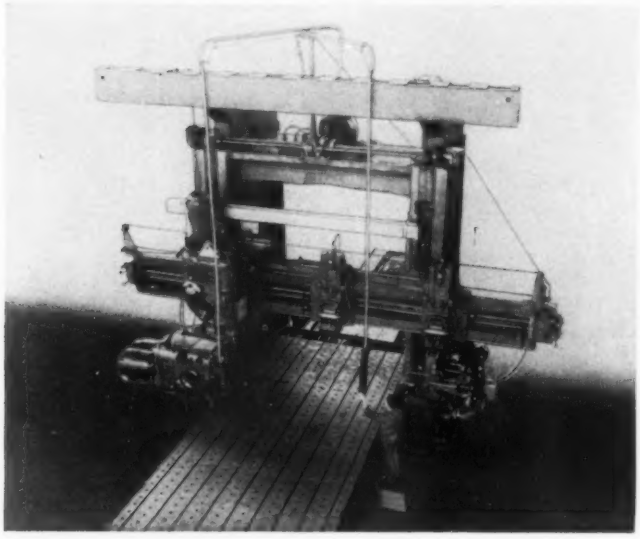


JIG BORER—*American Sip, Div. of Societe Genevoise D'instruments de Physique, 100 E. 42 St., New York, N. Y.* Boring spindle, spotting tool, and microscope of the Mp-1H borer can be brought successively on the same spot of the work by a single turn of the handwheel, without any dismantling.

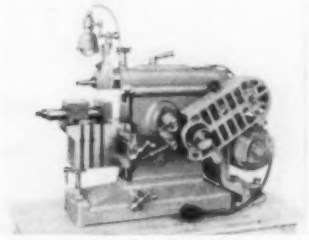
JIG BORER—*George Scherr Co., Inc., New York 12, N. Y.* The spindle on this Leitz jig borer is a combination drilling spindle and microscope. When the drill is removed, the microscope, with concentric circles, becomes operative. The work may thus be spotted, drilled, and inspected without removal from the table.

AMERICAN MACHINIST 1951 PRODUCTION PREVIEW

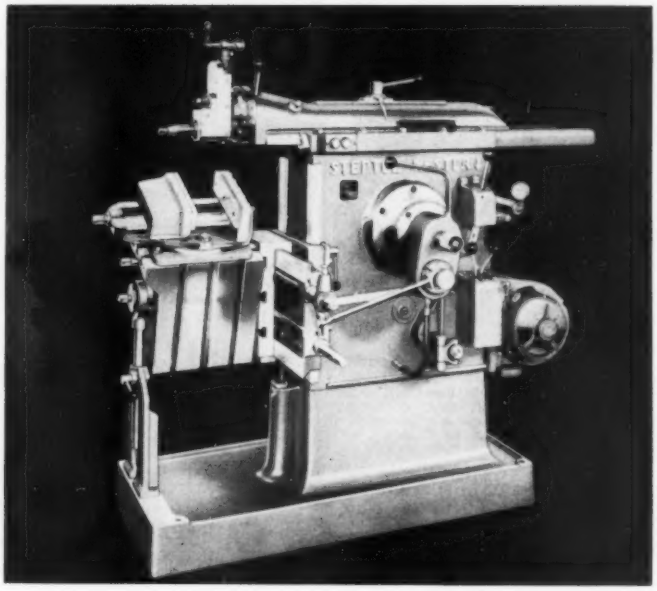
Planing and Shaping



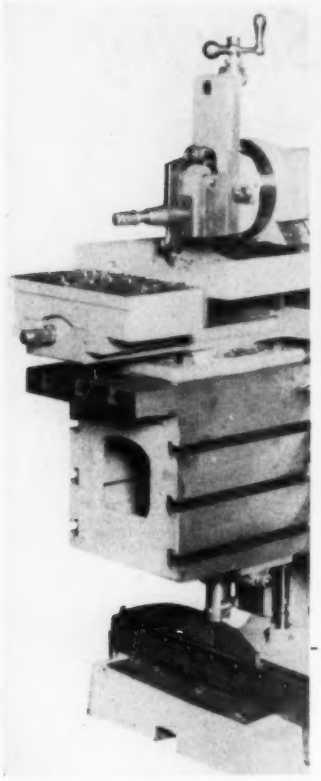
PLANER-MILLER—*Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* A combination heavy-duty planing machine has three planing heads: one right-hand and one left-hand head on the rail, and a right-hand side head on the column, plus two milling heads: one with a vertical spindle on the rail, and a horizontal spindle on the left-hand column.



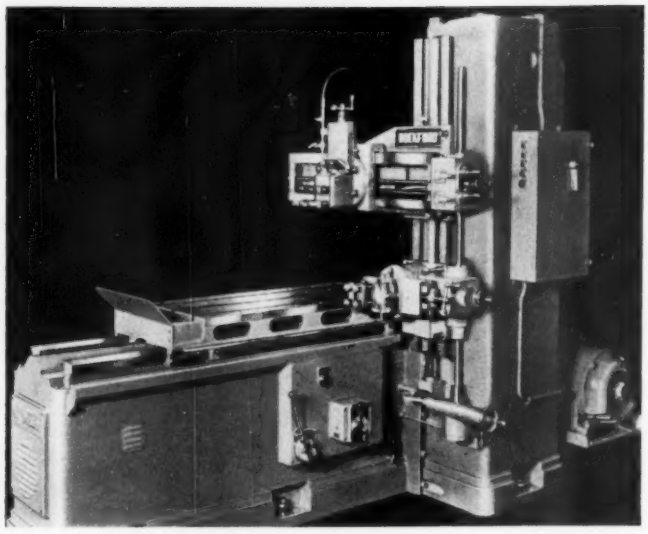
BENCH SHAPER—*Delta Power Tool Div., Rockwell Mfg. Co., Milwaukee 1, Wis.* The Delta 7-in. shaper has four speeds: 40, 70, 115, and 180 strokes per min. The adjustable toolhead is graduated from 0 to 90° for any angle work and has a vertical travel of 3¼ in.



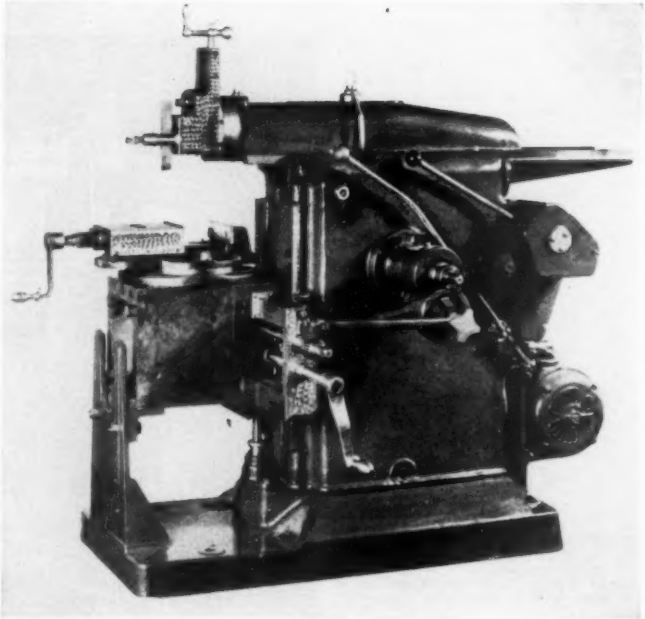
SHAPER — *Western Machine Tool Works, Holland, Mich.* A line of 12- and 15-in. shapers with 9 or 18 all-geared speeds. Ram speeds are up to 200 spm, with 8 automatic reversible feeds. →



DUPLICATOR ATTACHMENT — *The Cincinnati Shaper Co., Hopple, Garrard & Elan Sts., Cincinnati 25, Ohio.* Shaper is used for automatically shaping contours on dies, clamps, cams and other parts without laying the contour on the work and cutting to a line as is normally done.



HYDRAULIC SHAPERS — *Rockford Machine Tool Co., Rockford, Ill.* Hydraulic openside shapers are being produced with 48-, 60-, and 72-in. stroke lengths. Added lengths allow the machines to accommodate longer shaper work and small planer work.



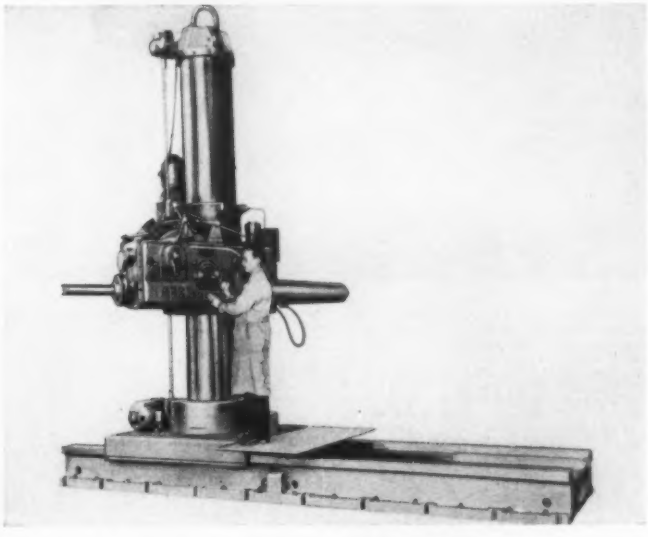
HOT-PLANING DEVICE—*The Oxweld Railroad Service Co., Unit of Union Carbide and Carbon Corp., 230 N. Michigan Ave., Chicago 1, Ill.* Device uses tools tipped with Haynes Stellite hard-facing alloy to trim the top and sides of rails after pressure-welding.

→

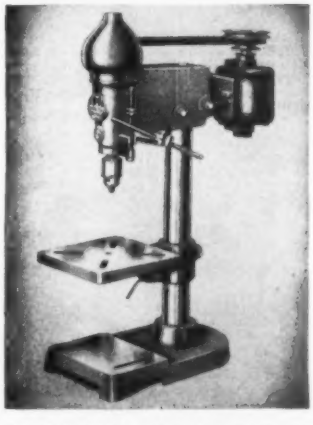
SHAPER — *DCMT Sales Corp., 164 Duane St., New York 13, N. Y.* Ram speeds vary from 27 to 140 strokes per minute. Automatic horizontal-feed motion is arranged to give four variations of feed per stroke.

Drilling

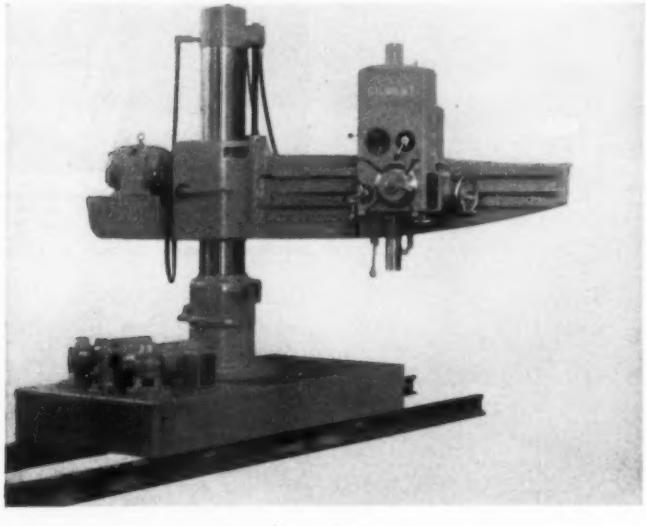
DRILLING MACHINE — *Sibley Machine and Foundry Corp., South Bend, Ind.* The Model E-25, 765-lb drilling machine, was developed to fill the gap between the larger models and the light bench class. It provides 25-in. swing, a variable-speed drive, and a rectangular 18x26-in. table with coolant trough.



DRILLING MACHINE — *Kaukauna Machine Corp., Kaukauna, Wis.* Heavy-duty horizontal drilling and tapping machine is equipped with a 4-in.-dia nitrided spindle with 36 inches of manual and power feed. The head swivels 45° up and down from the horizontal position and the 22-in.-dia column swivels 360°.



DRILLPRESS — *South Bend Lathe Works, South Bend 22, Ind.* Known as the Economy Model, this 14-in. drillpress is available in both bench and floor models. Spindle runout is 0.005 in., spindle square to table within 0.0075 in. in 5 in.



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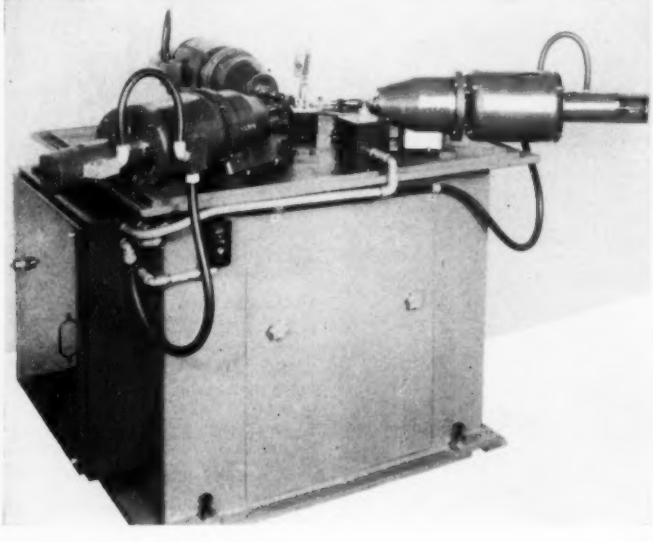
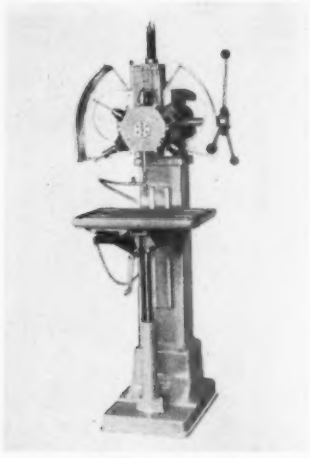
RADIAL DRILL—*The Cincinnati Gilbert Machine Tool Co., 3366 Beekman St., Cincinnati 23, Ohio.* Has a base 46-in. wide by 90-in. long, which will ride on standard Cincinnati Gilbert horizontal boring-mill runways, or 100-lb. rails.

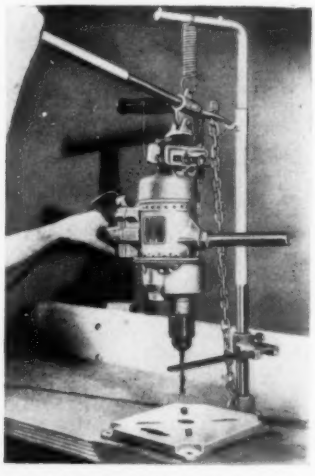
DRILLPRESS—*Atlas Press Co., North Pitcher St., Kalamazoo, Mich.* A float-drive with six-splined spindle and steel drive sleeve supported by two ball bearings are built into these 15-in. drillpresses.

DRILLER — *Govro-Nelson Co., 1933 Antoinette, Detroit 8, Mich.* Drilling six No. 51 wire holes in a cap screw with hardness of 25 Rockwell C, the machine showed a production rate of 288 pieces per hour.

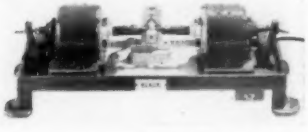




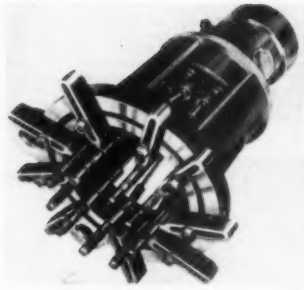
SIX-SPINDLE DRILLER—*Burg Tool Mfg. Co., Dept. A.M., 3743 Durango Ave., Los Angeles 34, Calif.* The Burgmaster, a six-spindle automatic indexing, drilling, and tapping machine, has a safety shield which protects the operator from the spindles during indexing.



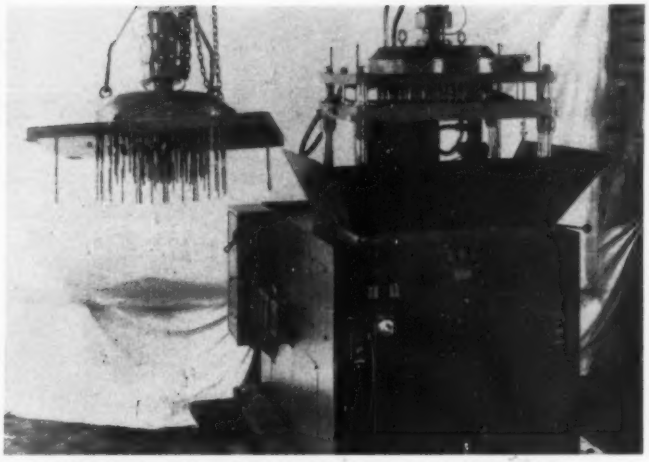
DRILLPRESS—*Sudenga Iron Works, George, Iowa.* Weighing 26 lb., this portable drillpress may be used, as shown, on shop workbench, or dismounted, to apply leverage in hard-to-reach spots.



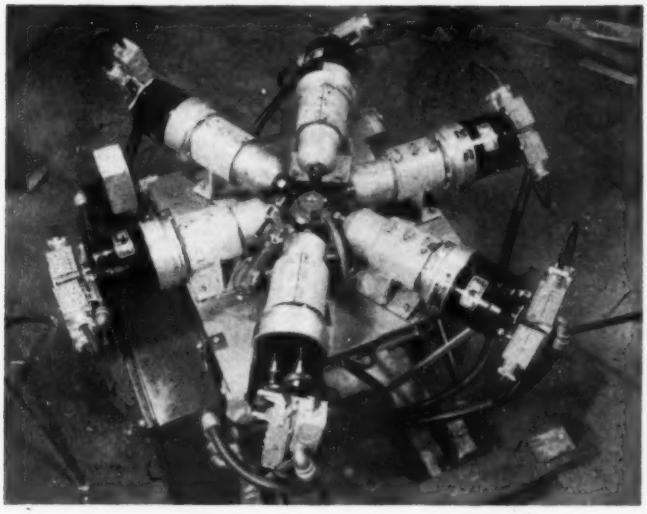
COUNTERSINKER—*Black Drill Co., 1400 E. 222nd St., Cleveland 17, Ohio.* A machine for fast countersinking, chamfering, and burring has opposed cutting tools in collets.



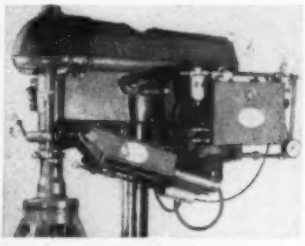
DRILLHEAD — *Sellew Machine Tool Co., Pawtucket, R. I.* In this head, the upper or driving end of the spindle universal is adjustable around a circular T-slot. Since the spindle arm is adjusted in the same manner, the working angle can be reduced.



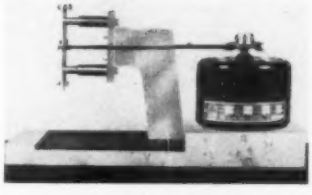
DRILLING MACHINE—*Zagar Tool, Inc., 24000 Lakeland Blvd., Cleveland 23, Ohio.* Built on gearless-drillhead principles, it drills approximately 100 closely spaced holes simultaneously in large aluminum castings. Feed is accomplished with a vertical ram which presses the work into the drill.



DRILLING MACHINE—*Simplex Engineering Co., 2540 Park Ave., Detroit 1, Mich.* Simultaneously drills seven holes in Army-Navy Aeronautical Standard hex-head bolts. The bolt is loaded manually and held by an air clamp.



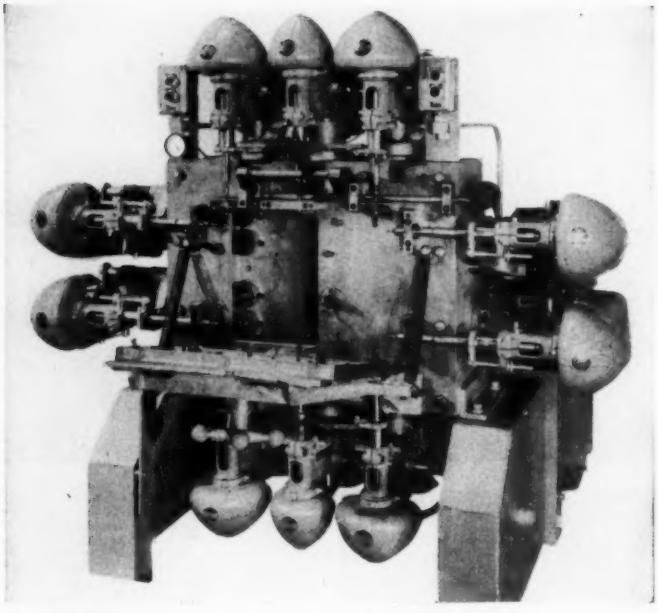
DRILLPRESSES — *The Beckett-Harcum Co., Wayne Road, Wilmington, Ohio.* Proper thrust and correct drilling action for practically any size drill working in any drillable material are said to be provided by the Air Feed. Accuracy of 0.001 in. is said to be maintained on depth control.



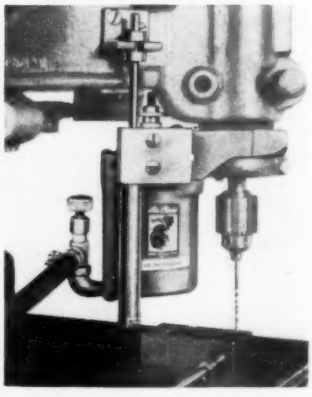
DRILL-CHIP BREAKER — *Commander Mfg. Co., 4225 West Kinzie St., Chicago 24, Ill.* Manufacturers claim the breaker will increase drilling speeds up to 50% over commonly accepted standards. It is also reported to increase drill life and the number of holes between sharpenings.

MICRO DRILLING MACHINE—*Dudley Cohen, Walcon Distributor, 116 West 72nd St., New York 23, N. Y.* The only moving part in this micro drilling machine is the spindle. It runs in bronze oilless bearings of the V-type and is held in place by a rubber-drive belt.

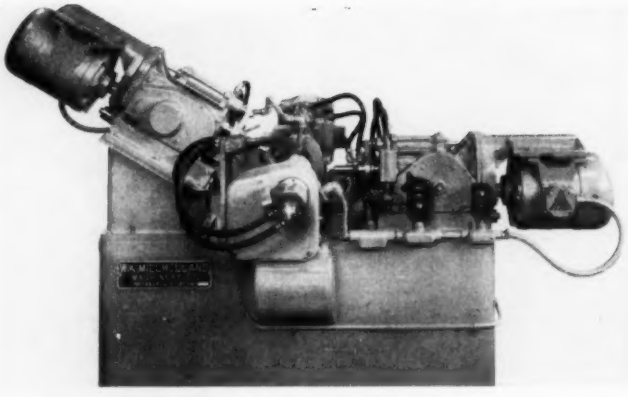
DRILLPRESS FEED — *Modernair Corp., 4222 Hollis St., Oakland 8, Calif.* Pneumatic feed permits controlled-power operation. A three-way valve permits manual, semi-automatic, or automatic operation.



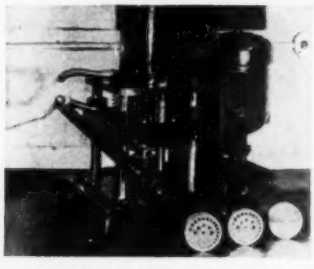
DRILLER—*Delta Mfg. Div., Rockwell Mfg. Co., No. 600 E. Vienna Ave., Milwaukee 1, Wis.* 18 holes are drilled on four sides and the bottom of the cast table for a new tilting-arbor saw on this special single-purpose machine. Eighteen standard Delta drilling units ←are used.



DRILLPRESS FEED ATTACHMENT —*Mead Specialties Co., 4114 N. Knox Ave., Chicago 41, Ill.* The Hydro-Check offers a steady resistance to the power of the air feed, or increased resistance at a definite point in the stroke.

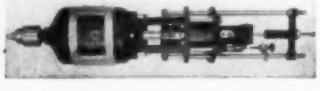


HORIZONTAL DRILLER — *National Automatic Tool Co., Richmond, Ind.* Machines and assembles 248 refrigerator pistons per hour. Components include a vertical unit and head with standard column-wide ways; left front and rear horizontal units and drill heads.

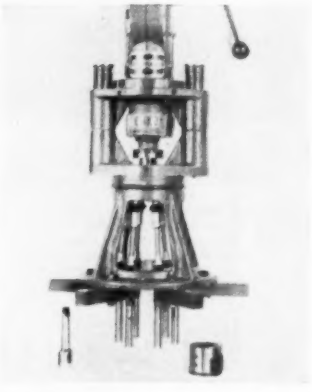


DRILLING MACHINE—*Zagar Tool Inc., 23880 Lakeland Blvd., Cleveland, Ohio.* The Jig Driller consists of a four-post pump-type drill jig mounting a standard Zagar gearless drillhead with a hole pattern to suit the part being drilled.

AUTOMATIC INDEX MACHINE—*W. K. Millholland Machinery Co., 6402 Westfield Blvd., Indianapolis 5, Ind.* Incorporates two automatic units mounted horizontally at right angles and a third on an angle around the work. A series of 12 holes is drilled around the periphery of a flanged bushing and 24 holes are drilled in the flange end.

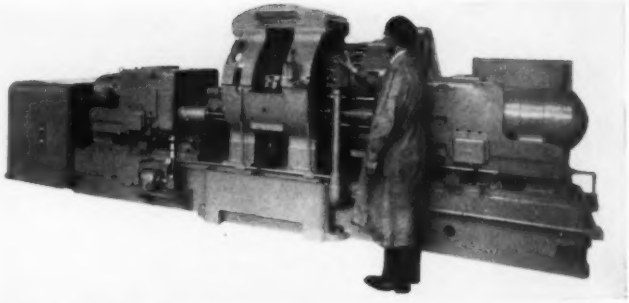


DRILLING UNIT—*Black Drill Co., 1440 E. 222nd St., Cleveland 17, Ohio.* In-line construction of the No. 1000 Series drilling units is said to give balanced action and evenly loaded force. Made of one-piece castings.



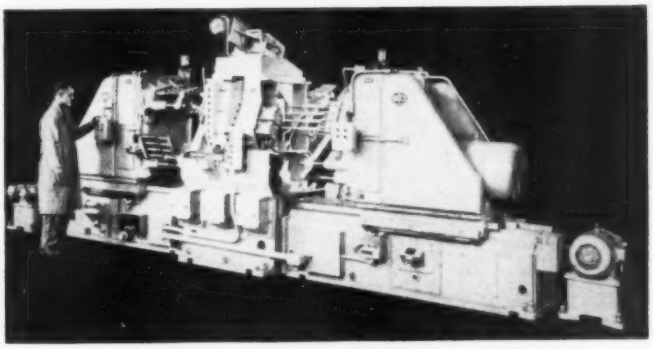
MULTIPLE-DRILL UNIT — *Thriftmaster Products Corp., Div. of Thompson Industries, Inc., 10 North Plum St., Lancaster, Pa.* The Thriftmaster drilling and tapping unit is composed of a standard multiple-spindle adjustable drillhead and a standard Dorman automatic reverse-tapping attachment.

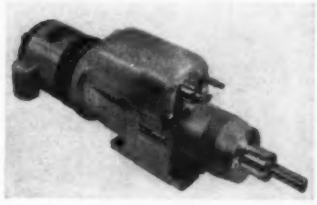
HORIZONTAL MACHINE — *Barnes Drill Co., 830 Chestnut St., Rockford, Ill.* Performs 22 operations on a water-pump body, combining operations previously done on three special machines. It drills, reams, faces, bores, chamfers and hollow-mills 90 pieces per hr at 80% efficiency. →



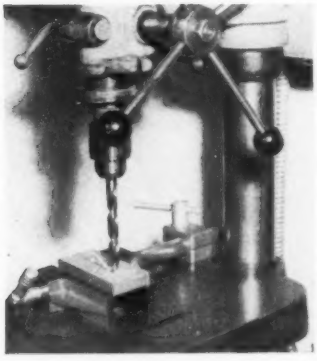
AUTOMATIC DRILLER — *National Automatic Tool Co., Inc., Richmond, Ind.* Capable of drilling 32 small holes in six faces of plastic cash-register drawers. Production is 50 per hour. Hole sizes range from 0.098 to 0.199 in., which is said to be unusual in such high-speed work.

HOPPER-FED MULTI-DRILLER— *National Automatic Tool Co., Richmond, Indiana.* Drills, chamfers, and rough and finish reams 575 automotive piston pins per hr. Parts are automatically loaded and processed, four at a time. A conveyor, attached to the rear of the fixture, carries away chips. →



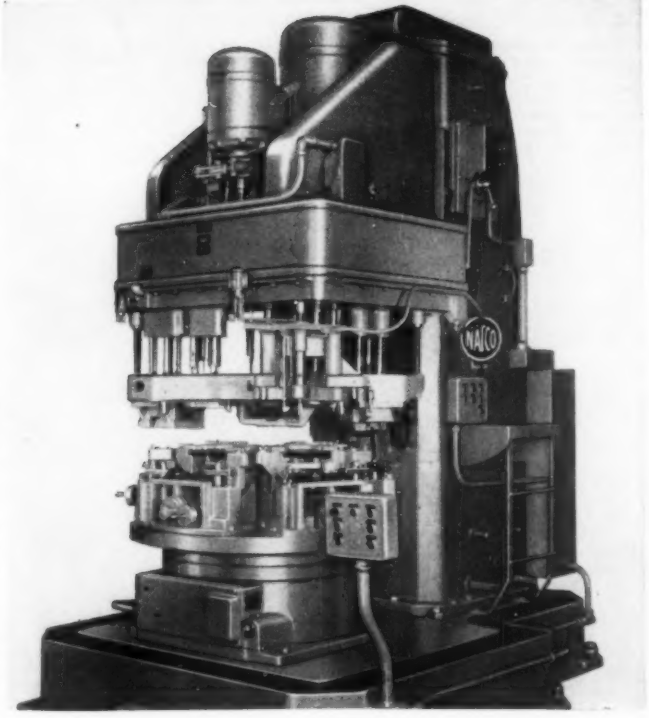


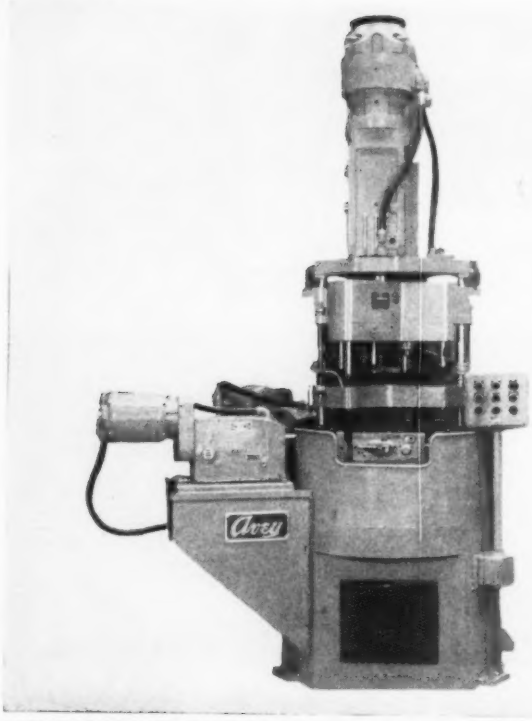
DRILL UNIT—*Delta Mfg. Div., Rockwell Mfg. Co., 600 E. Vienna Ave., Milwaukee 1, Wis.* Air-hydraulic drill units are available with direct-motor drive, gear drive, or pulley drive. Drillheads are equipped with built-in recycling switch providing for electrical remote control.



DRILLPRESS VISE — *Float-Lock Corp., 224 Glenwood Ave., Bloomfield, N. J.* Vise can be moved to any position on the table and locked by a quarter turn of the handscrew. Jaws have enclosed screw to keep chips from interfering with operation.

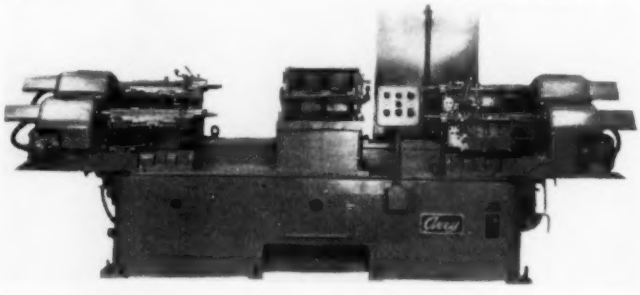
AUTOMATIC DRILLER — *National Automatic Tool Co., Richmond, Ind.* Performs a total of 2700 operations per hr. at each of four positions simultaneously. It drills, reams, rough and finish counterbores, chamfers, spotfaces, and taps both sides of 90 parts per hr. →

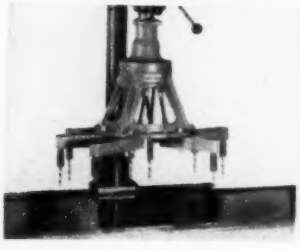




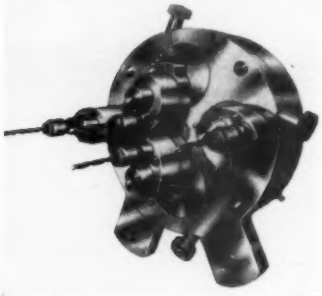
AUTOMATIC-INDEXING DRILLER —*Avey Drilling Machine Co. Inc., Cincinnati 1, Ohio.* Arranged with a cam-feed unit mounted vertically on a steel-fabricated adapter column and base, and drives a six-spindle oil-circulating drillhead. Index table is arranged with five sets of double-acting fixtures.

HORIZONTAL DRILLING MACHINE —*The Avey Drilling Machine Co., Cincinnati 1, Ohio.* Consists of two sets of No. 1 Aveydraulic Torquematic deep-hole drilling units mounted opposed at a suitable angle on a steel-fabricated base. The machine drills a 0.2812-in. hole the entire length of a 15.797-in.-long auto input shaft. ▼

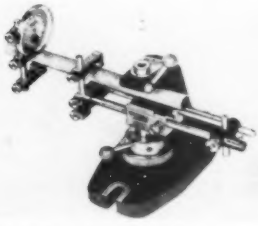




DRILLER — *The Avey Drilling Machine Co., Cincinnati 1, Ohio.* Machine reams, drills, and taper reams 324 compressor connecting rods in 52 min. The machine utilizes three No. 1 Avey automatic-cam feed units.



DRILLING HEADS—*Errington Mechanical Laboratory, Inc., Staten Island 4, N. Y.* Offering a wide range of adjustments and provided with a fingertip locking arrangement, these adjustable heads can drill in a variety of irregular patterns.

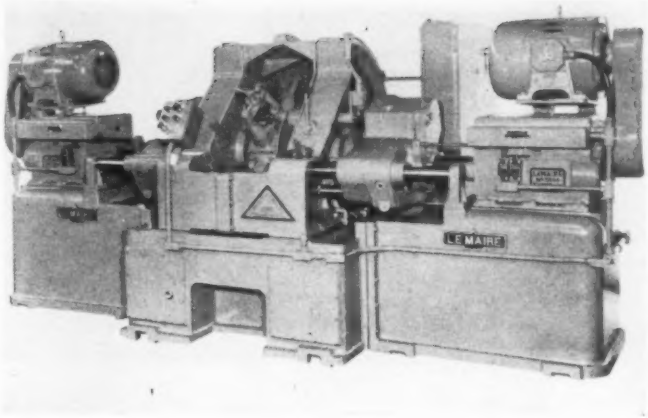


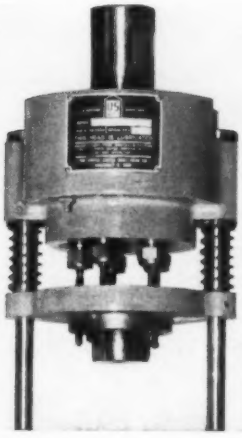
DRILLING ATTACHMENT — *Cosa Corp., 624 Chrysler Bldg., New York 17, N. Y.* Universal drilling tool, the "Reglus," is to simplify the drilling of round, flat, square, or hexagonal workpieces within an accuracy of 0.0003 in.

END-FINISHING MACHINE — *Pines Engineering Co., Inc., Aurora, Illinois.* Center-drilling bars, hollow milling the end of a forging, and facing radius on the end of a rod are among the operations performed by this Series 700 floor-model.

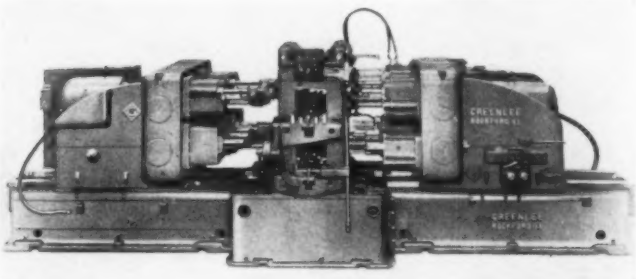
EXTENSION SPINDLES—*The Commander Mfg. Co., 4225 W. Kinzie St., Chicago.* Accessory to the Multi-Drill, the attachment which permits the drilling or tapping of from 2 to 8 holes at one stroke of a drill press, increases the maximum drilling area from a ◂—9- to a 22½-in. bolt circle.

DRILLER—*LeMaire Tool & Mfg. Co., Dearborn, Mich.* Consists of a fabricated-steel center base which supports the fixture trunnion and houses a coolant tank. Each of two cast-iron end bases support a twin-ram unit for driving and feeding a three-spindle head mounted on guide bars. The machine drills, counterbores, and reams a steering gear idler and third arm bracket. →





DRILLHEADS—*U. S. Drill Head Co., Dept. T, 616-618 Burns St., Cincinnati 4, Ohio.* Drillheads, being designed for specific work, are entirely of the fixed-center-distance variety for greater use and more complete rigidity.

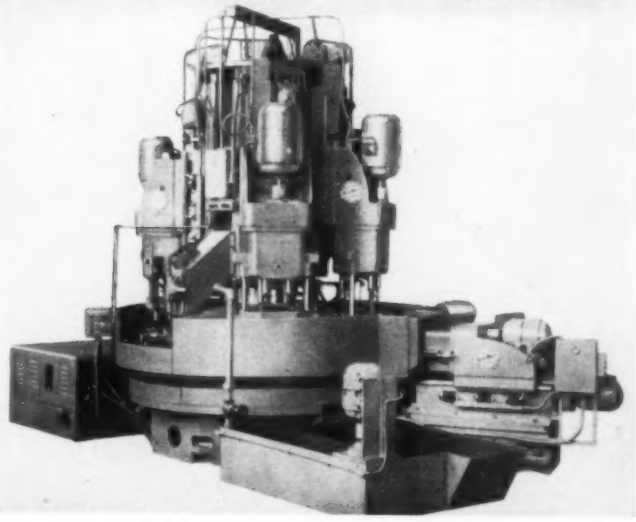


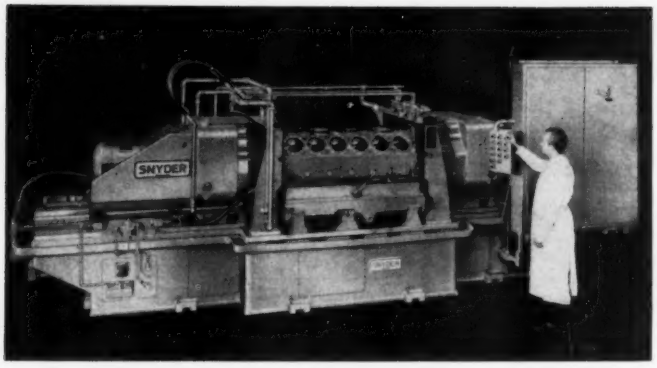
TRANSFER MACHINE — *Greenlee Bros. & Co., Rockford, Ill.* Employing a double-deck system, this machine performs 60 drilling, reaming, and tapping operations on the sides and ends of cylinder and valve housings. Work pieces are transferred manually from one station to another through a continuous-chain system.

VERTICAL INDEXING MACHINE —*Davis & Thompson Co., Milwaukee, Wis.* Drills and reams two suspension holes and the king-pin hole of automobile front-suspension support arms. Six stations are provided with two-station holding fixtures to take both a right- and left-hand part so that finished pieces are removed in pairs. ▼

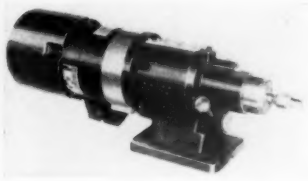
DRILLHEAD—*Dumore Co., Racine, Wis.* Drillhead employs a motor having a double-end armature shaft. The motor supplies the power for drilling, while the compressor advances the drill at pre-determined speed and pressure.

PLOW-FROG DRILLER — *Davis and Thompson Co., 6411 W. Burnham St., Milwaukee 14, Wis.* Has four power heads, each having independent hydraulic feed and spindle speed-change gears. Clamping of the work piece is accomplished through the use of a single, hydraulic clamping fixture.

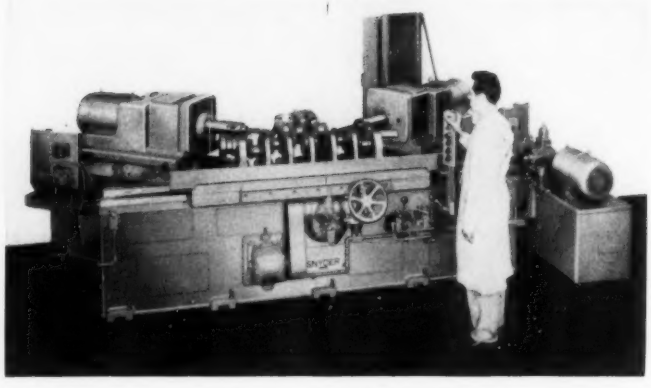




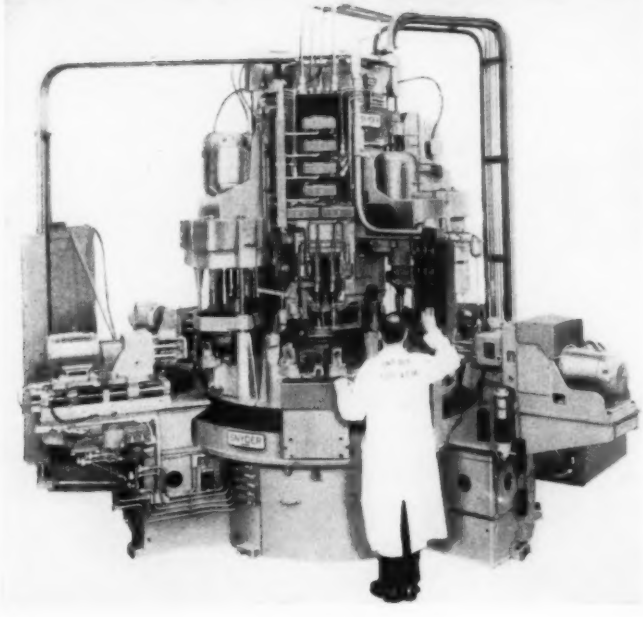
DRILLER—*Snyder Tool & Engineering Co., Detroit, Mich.* Two-way horizontal line-index machine is equipped with two Snyder standard hydraulic side units which carry multiple-spindle heads and is said to permit greater accuracy in drilling, reaming, and tapping holes in large aluminum-alloy ←crank cases.

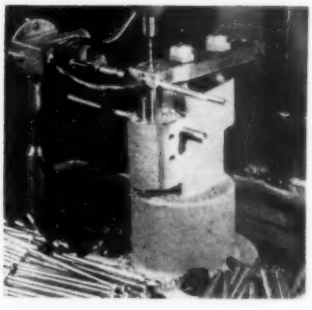


DRILLING UNIT—*The Govro-Nelson Co., 1933 Antoinette St., Detroit 8, Mich.* Feeding pressure of the Model KH drilling unit is derived from hydraulically controlled centrifugal force. By external adjustments, the amount of rapid approach, rate of feed, and over-all length of stroke may be changed as desired.



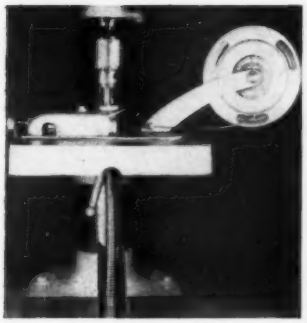
SPECIAL DRILLER—*Snyder Tool & Engineering Co., 3400 E. Lafayette, Detroit, Mich.* Puts lightening holes in large tractor crankshafts. It is indexed through six stations at each of which two 1½-in. holes are drilled in ←the cheeks.





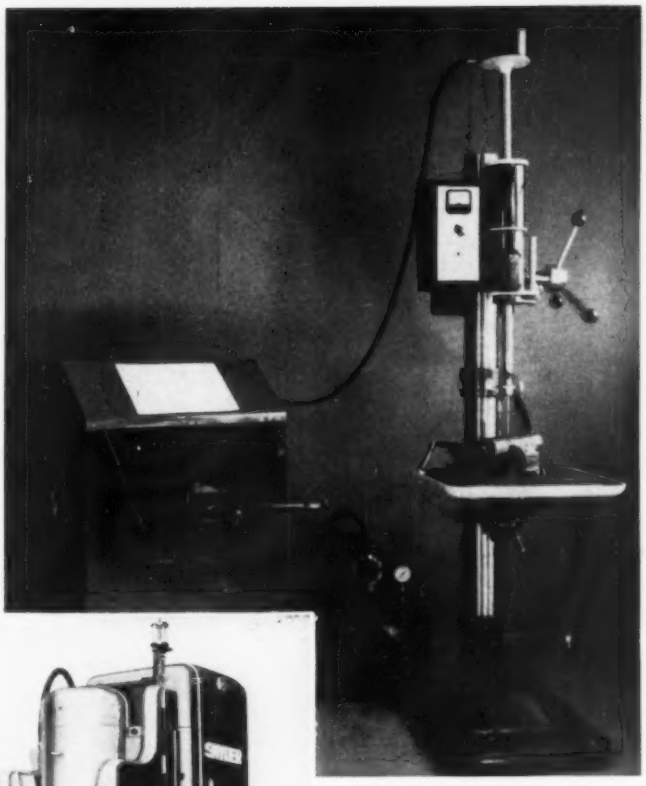
CROSS-DRILLING FIXTURE—*Snow Mfg. Co., 435 Eastern Ave., Bellwood, Ill.* A wide range of cross-drilling applications, both short and long run are handled by the No. 4 universal fixture, eliminating the necessity of tooling for each job.

AUTOMATIC CYCLE MACHINE—*Snyder Tool & Engineering Co., 3400 E. Lafayette Ave., Detroit 7, Mich.* With six stations it processes a cast-iron converter housing for automatic transmissions in 31½ seconds. It drills, chamfers, reams, counterbores, and ←taps.



DRILLPRESS ATTACHMENT—*Cycloid Corp., 12 Newhall Ave., Saugus, Mass.* Springs may be made at high speed on any ½-in. drillpress, by use of the Spring-Master. Wire from 6 ga (0.016) to 28 ga (0.071) is handled and OD of finished springs can be varied from 3/16 to ⅝ in.

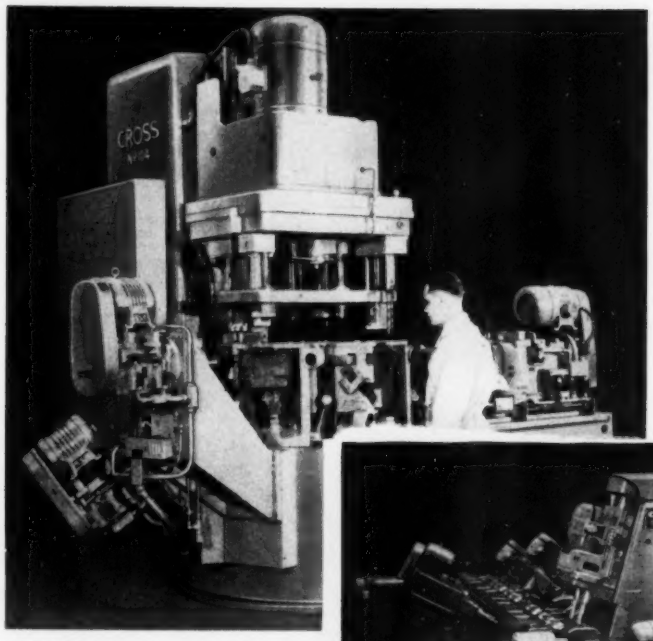
DRILLING AND TAPPING—*Snyder Tool Engineering Co., 3400 E. Lafayette, Detroit, Mich.* Six-station vertical machine drills, spotfaces, chamfers and taps 512 differential bearing caps at 100% efficiency. Work cycle is 21 sec, and is automatic.



ELECTRONIC DRILL—*Elox Corp. of Mich., 740 N. Rochester Rd., Clawson, Mich.* Motor-driven automatic hard-metal drilling machine employs an electronic principle of operation and is reported to increase speeds of cutting hardened steels as much as 15 times that of previous Elox models. Power required is cut to one-fifth.

HORIZONTAL DRILLING MACHINE—*Zagar Tool Inc., 24000 Lakeland Blvd., Cleveland 23, Ohio.* Two gearless drillheads and two hydraulic drill feeders—drill and countersink holes on both sides of ¾-in.-sq steel inserts for an overriding clutch assembly.

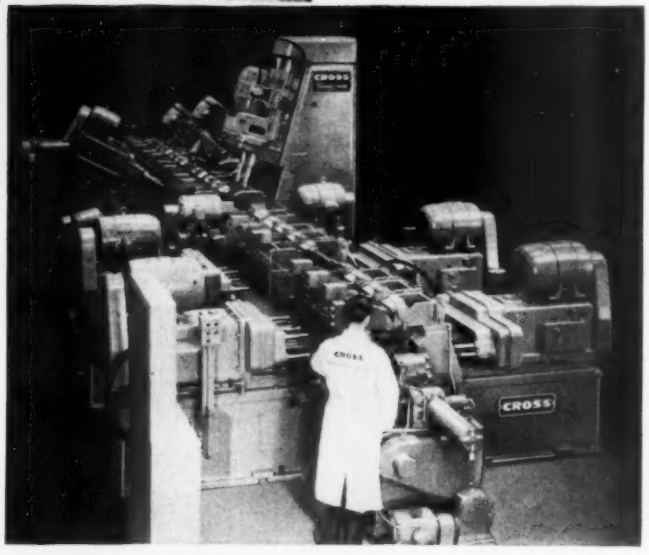
DRILLING—*Snyder Tool & Engineering Co., 340 E. Lafayette, Detroit 7, Mich.* Drilling and chamfering of a 36-in. steel ring, 3¼-in. thick is done by this special-purpose machine. It has a capacity of 1.6 pieces per hour at 80% efficiency, and is equipped with a control mechanism which provides for alternating the depth of the holes.



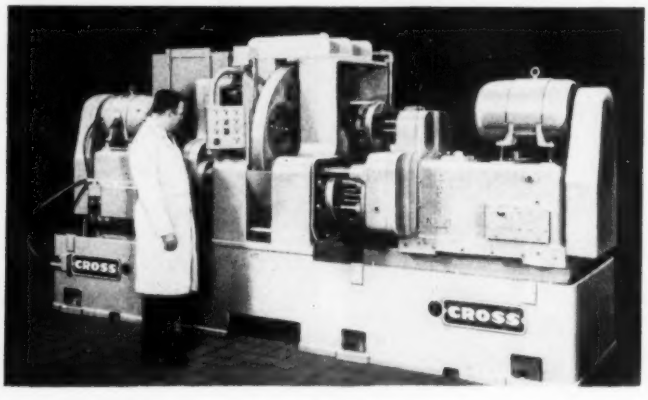
TRANSFERMATIC—*Cross Co., Detroit 7, Mich.* Drills, bores, and taps automatic-transmission extensions. It has 12 stations, including one for loading, ten for cutting, and one for unloading. Two-position progressive type, palletized work-holding fixtures are used.

AUTOMATIC-CYCLE MACHINE — *The Cross Co., Detroit 7, Mich.* Planetary-gear cages are drilled, tapped, reamed, and counterbored at a rate of 75 parts per hr at 100% efficiency on this machine. Multiple operations on opposite sides of the part are handled simultaneously in each station by double loading.

DRILLING—*The Cross Co., Detroit 7, Mich.* Drilling, reaming, and spotfacing of automatic-transmission housings is accomplished on this special machine tool. It has five stations, dial type, with power-driven index table. One operator finishes 85 pieces per hour at 100% efficiency. ▲



DRILLING—*Cross Co., Detroit 7, Mich.* Drilling and boring of aircraft cylinder heads is accomplished by this Transfermatic. It drills the valve guide holes and rough-forms the valve pockets and spring compartments.

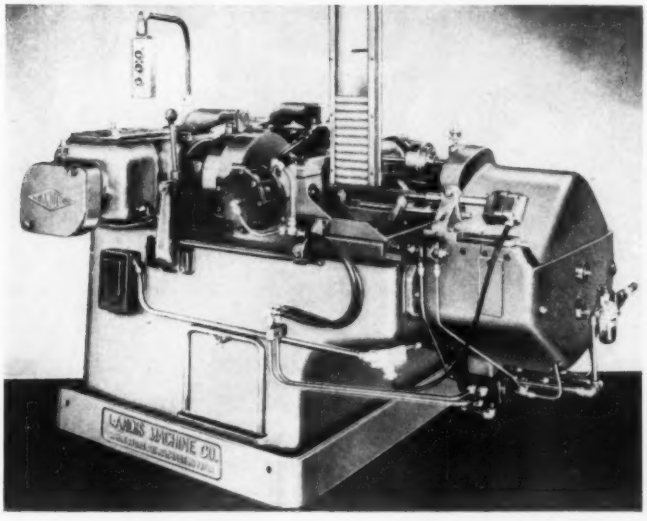


TRANSFERMATIC MACHINES—*The Cross Co., Detroit 7, Mich.* Two Transfermatics do all the drilling, reaming, tapping, spotfacing, and considerable milling on transmission gear boxes made by the Warner Gear Div. of Borg-Warner. Some 100 electric controls have been eliminated by the use of a hydraulic-mechanical control system. ▲

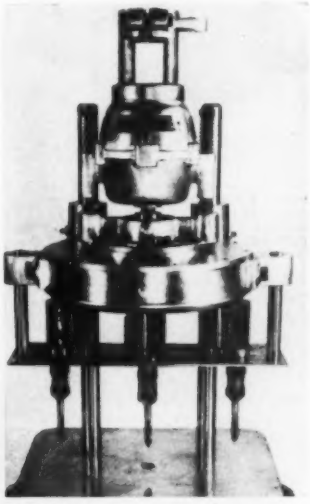
←
DRILLER—*The Cross Co., 3250 Bellevue, Detroit 7, Mich.* Automotive flywheels are drilled, chamfered, and reamed at a rate of 140 pieces per hr at 100% efficiency on this special machine. It is a 5-station index-trunnion unit with a fluid motor for indexing.

AMERICAN MACHINIST 1951 PRODUCTION PREVIEW

Tapping and Threading



NIPPLE THREADER — *Landis Machine Co., Waynesboro, Pa.* These automatic nipple-threading machines are produced in two types, one for long and the other for close nipples. They thread, ream, and chamfer nipples in a continuous automatic operation, thus eliminating secondary manual handling.

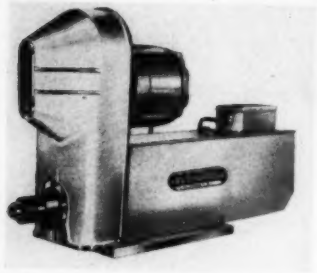


TAPPING HEAD—*Ettco Tool Co., Inc., 59½ Johnson Ave., Brooklyn 6, N. Y.* Quick spindle adjustments can be made from a minimum center distance of 1 1/16 in. to a maximum center distance of 7⅝ in. on this adjustable-spindle multiple head.

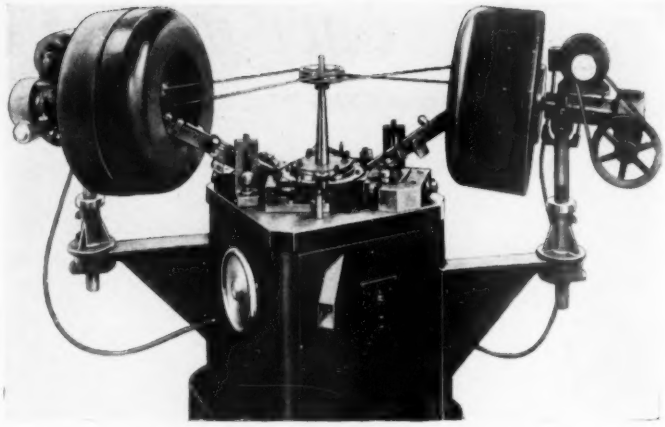
TAPPING MACHINE—*Barnes Drill Co., Chestnut St., Rockford, Ill.* A single lever controls speed changes, and a single dial operates feed changes on the Barnesdril 201 ¼ standard drilling machine.

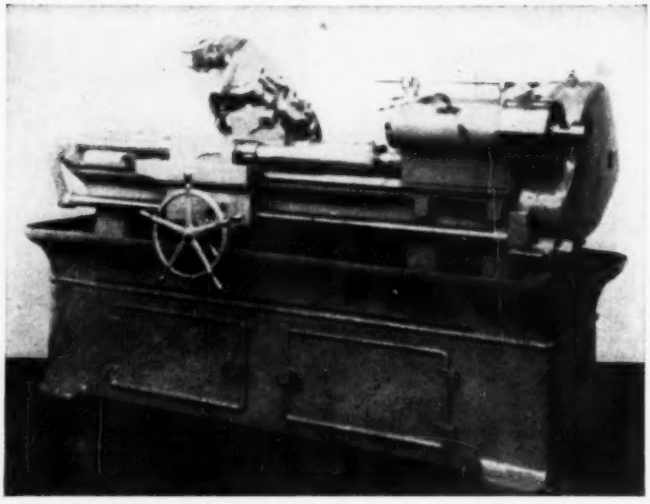
THREAD RESTORER — *Buckingham Mfg. Co., Inc., Binghamton, N. Y.* Suited for reconditioning closely spaced studs and bolts that are battered, distorted or rusted. Completes a range of sizes for all ASME and SAE standard threads from ¼- to 4-in. diameter.

TAPPING HEAD—*Procunier Safety Chuck Co., Dept. 4, 18 S. Clinton, Chicago, Ill.* The Tap King tapping head has capacity of ⅜ to 1 in. in steel, and ⅛ in. in softer materials. It is equipped with friction-clutch, spline drive to tap-holder spindle, ball and needle bearings, and a helical back-gear reversing mechanism.

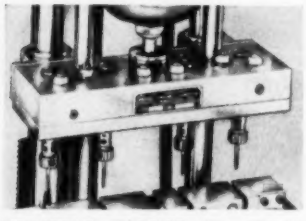


TAPPING MACHINE—*Auto-Tool & Engineering Co., Chicago 47, Ill.* The Auto-Drill is a production machine tool, for single and multiple setups, where a combination of reciprocating and rotary motion are necessary. It is suitable for drilling, reaming, boring, spinning, tapping, centering, and tube flaring.

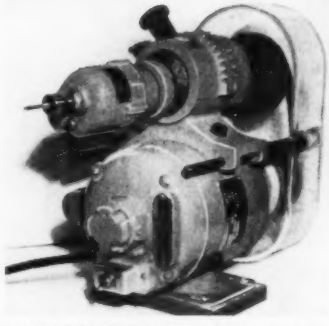




THREAD-GENERATOR — *George Scherr Co., Inc., New York 12, N. Y.* Cornelis thread-generating machine is for cutting lead screws, worms, and threads by a generating method using a circular cutter. No indexing is required, thus eliminating spacing errors.

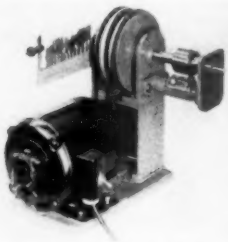


MULTIPLE TAPPER—*The Charles L. Jarvis Co., Middletown, Conn.* A chain, said to both withstand constant friction and to absorb heavy shock loads, transmits power from the Torquomatic drive to the spindles of this multiple tapping and drilling unit.

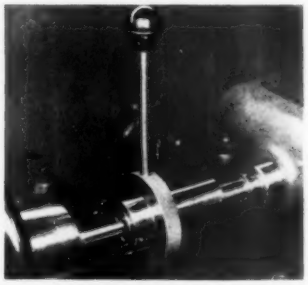


TAPPING UNIT—*The Charles L. Jarvis Co., Middletown, Conn.* The bench model Torqomatic for tapping and drilling operations consists of a built-in drilling unit with plastic-guard-enclosed pulley drive, powered by desired electric motor.

THREAD ROLLER—*D. H. Prutton Machinery & Tool Co., 5295 W. 130th St., Cleveland, Ohio.* Model 120 Rollmaster thread roller will roll lengths up to 2⅛ in. on diameters up to ¼ in. Said to hold a consistent thread tolerance of Class 3, or better.



THREADING UNIT — *Herbert M. Field, Portland 12, Oregon.* Breaking a tap is said to be almost impossible on the Sensi-Threader, as the design provides for automatically reversing the die or tap the instant the desired depth is reached.

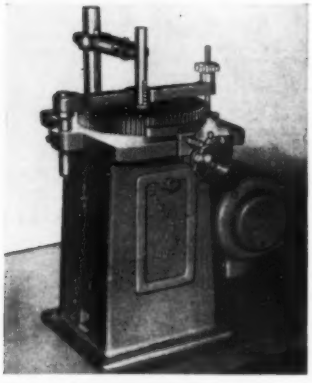


TAP CHASER—*Craft-Hollow Industries, Wallingford, Pa.* Tap and die chaser makes possible accurate thread cutting in sizes from No. 0-80 to 3 8/16 in. Both tap and die holders ride free on or inside the spindle.

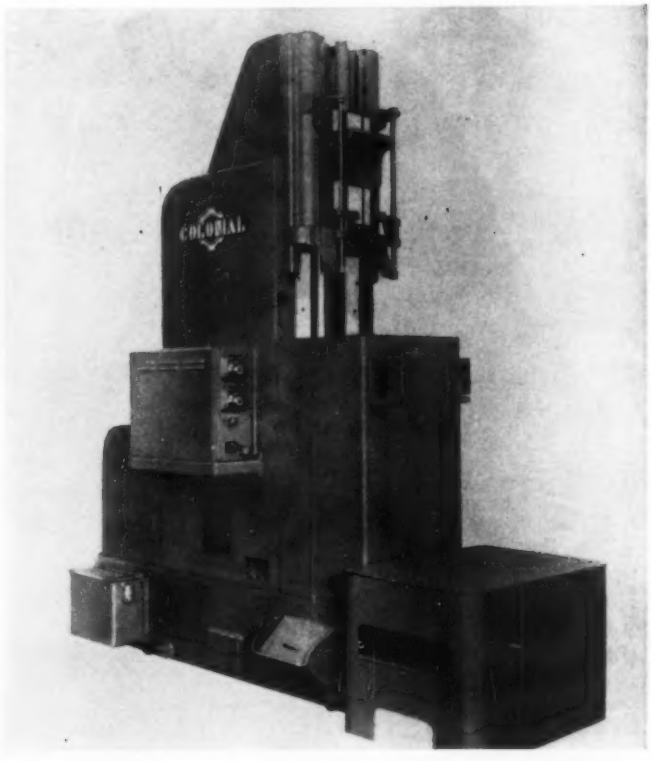
TAPPING HEAD—*United States Drill Head Co., Dept. T, 616 Burns St., Cincinnati 4, Ohio.* These drillheads, available in 56 sizes and five types, can be equipped with single-purpose tap chucks, floating tap holders, or safety tap holders.

AMERICAN MACHINIST 1951 PRODUCTION PREVIEW

Broaching

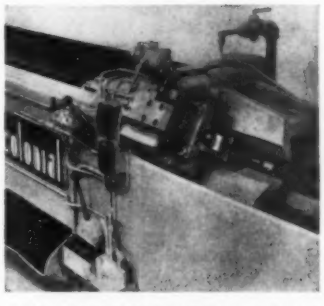


KEYSEATER — *Keymatic Machine Co., P.O. Box 1953, Cincinnati 1, Ohio.* Keyways 1/16 to ½ in. in cast iron, and 1/16- to ¾-in. steel can be cut by the No. 1 Keymatic. Centering feed to depth, relief on upstroke of cutter, and stop are all automatic and the machine uses no bushings.

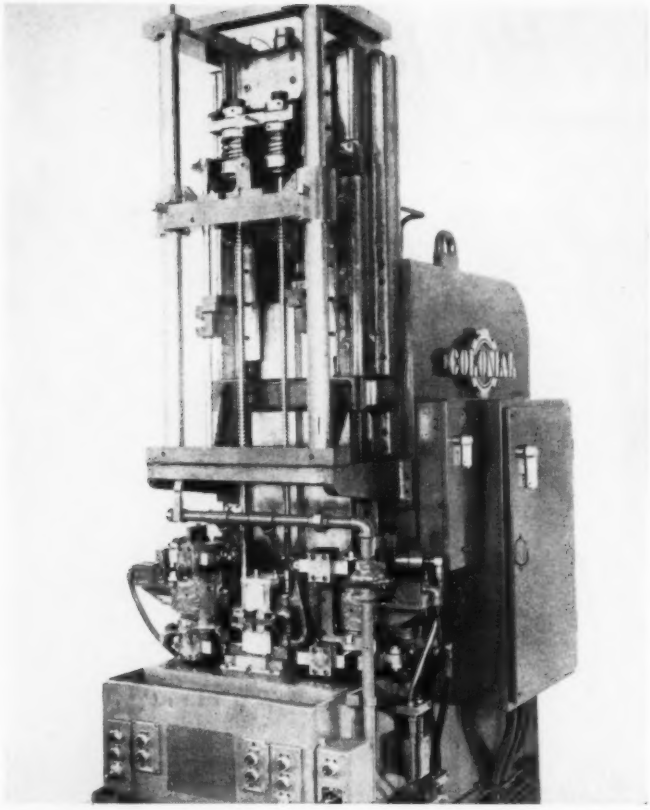


BROACHING MACHINES — *Colonial Broach Co., Box 37, Harper Station, Detroit 13, Mich.* Single- and dual-ram surface machines, and pull-up and pull-down internal machines have been redesigned to conform to the new standards of the JIC.

BROACHING MACHINE — *Colonial Broach Co., Detroit, Mich.* For general short runs in miscellaneous broaching, this 4-ton flat-top machine permits handling of large and smaller parts without special fixtures to support the work.

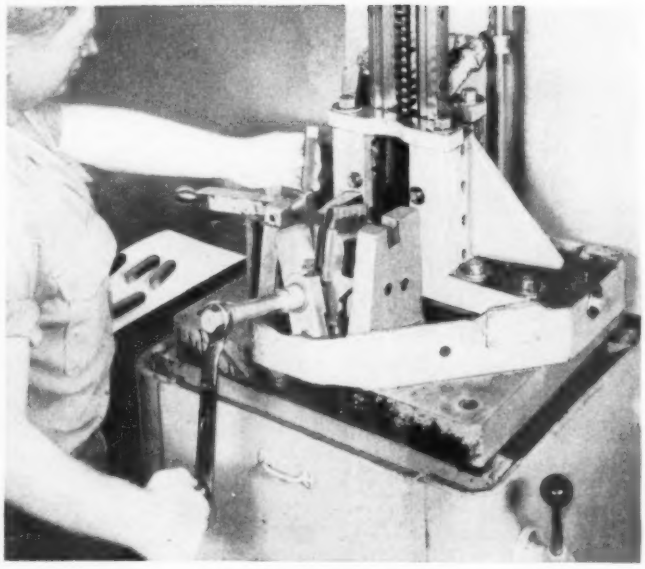


BROACHING FIXTURE — *Colonial Broach Co., Detroit, Mich.* Universal horizontal machine broaches, simultaneously, three equally spaced slots, ¾x2 25/32x5/16 in., in transmission-synchronizer clutch hubs using a special fixture.



BROACHING MACHINE — *Colonial Broach Co., Detroit, Mich.* Machines two steering knuckle supports. Automatic operation of this 10-ton, 54-in.-stroke machine includes clamping by spring-loaded clamps to prevent jamming or breakage in case of oversized forgings.

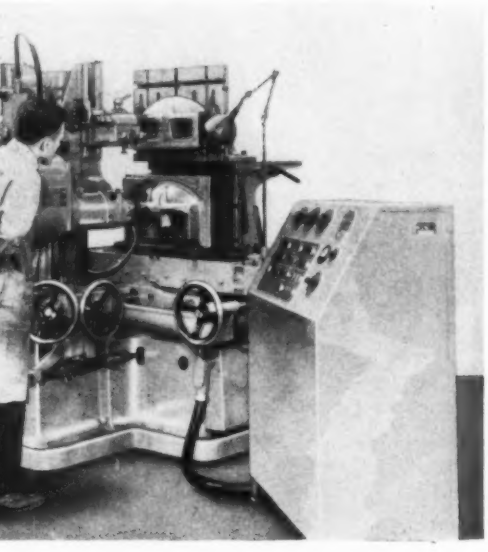
RING BROACHES—*Colonial Broach Co., Detroit, Mich.* A low-cost method of producing small toothed parts consists of pushing the parts through stationary ring broaches.

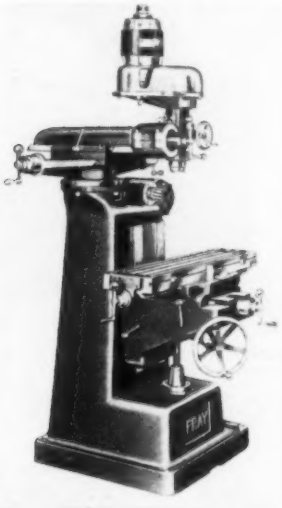


SURFACE BROACHING — *Colonial Broach Co., Detroit, Mich.* Accurately tapers both sides of from 6 to 15 hand-stamp blanks per cutting stroke. The two broaches are attached to the ram of a 10-ton, 36-in.-stroke press by means of a crosshead and T-slot arrangement.

Milling

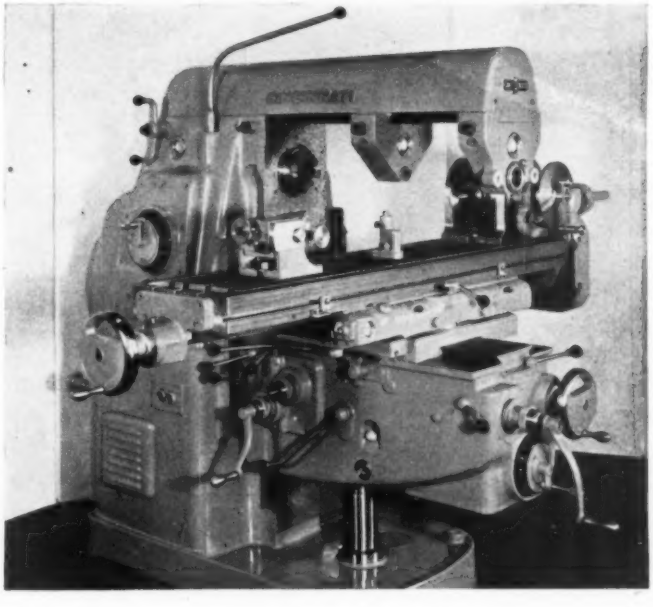
MILLING MACHINE—*Pratt & Whitney, Div. Niles-Bement-Pond Co., Hartford, Conn.* A development of automatic electric tracer control is said to enable the tracer to glide smoothly over any contour two to three times faster on finishing operations. An automatic tracer operating in conjunction with an automatic variable-speed control, provides continuous variation of the machine motions in proportion to the slope being followed.



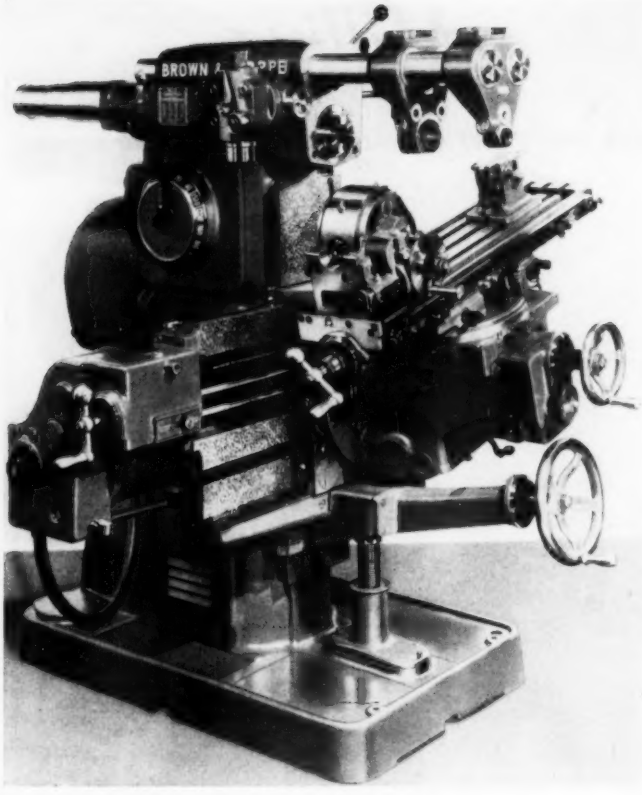


VERTICAL MILLER—*Fray Machine Tool Co., 515 W. Windsor Rd., Glendale, Calif.* Combining the features of several machines, the No. 10-R is an all-purpose machine. Operations can be done at any angle in either or both the vertical and horizontal planes.

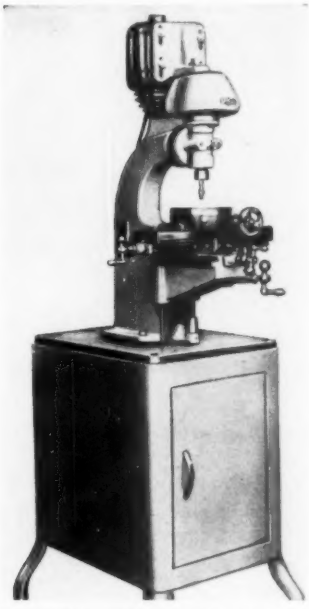
COPY MILLING MACHINE — *Cosa Corporation, 405 Lexington Ave., New York 17, N. Y.* When copy milling at a 1:1 ratio on this machine, the pantograph serves only as a guide for the tracing stylus and cutter-head spindle. The many attachments made for this machine are said to produce molds and dies with greater economy.



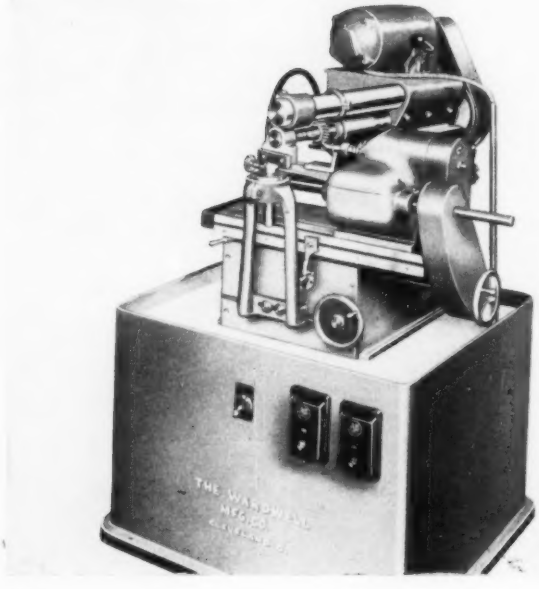
MILLING MACHINE — *Cincinnati Milling and Grinding Machines, Inc., Cincinnati 9, Ohio.* Larger than earlier models of the same line, the No. 3 MI machine is manufactured in both plain and universal styles and is built with duplicate hand and power controls. →

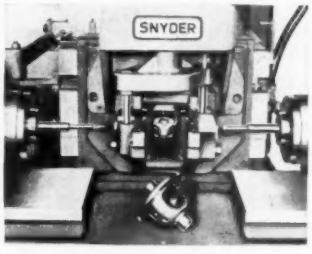


MILLING MACHINE — *Brown & Sharpe Mfg. Co., Providence 1, R. I.* Toolroom miller is said to have all the movements and adjustments common to a universal machine, plus other features which add to its versatility. The table and the knee assembly tilt around a horizontal axis in the plane ← of the cutter.



VERTICAL MILLER—*Columbia Enterprises, Inc., Grayslake, Ill.* The No. 1 Columbia milling machine is precision machined to hold tolerances up to 0.001 in. Milling, drilling, boring, and routing can be done at any angle.

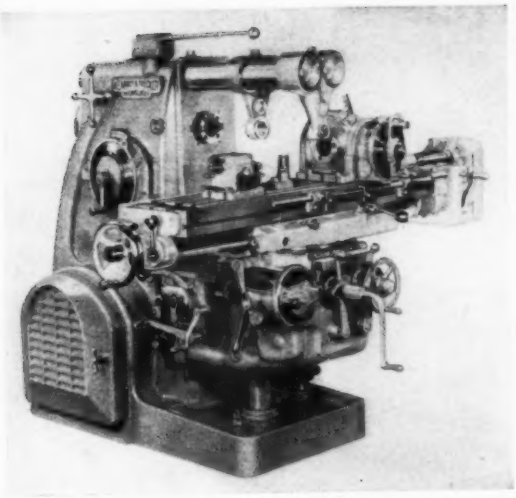




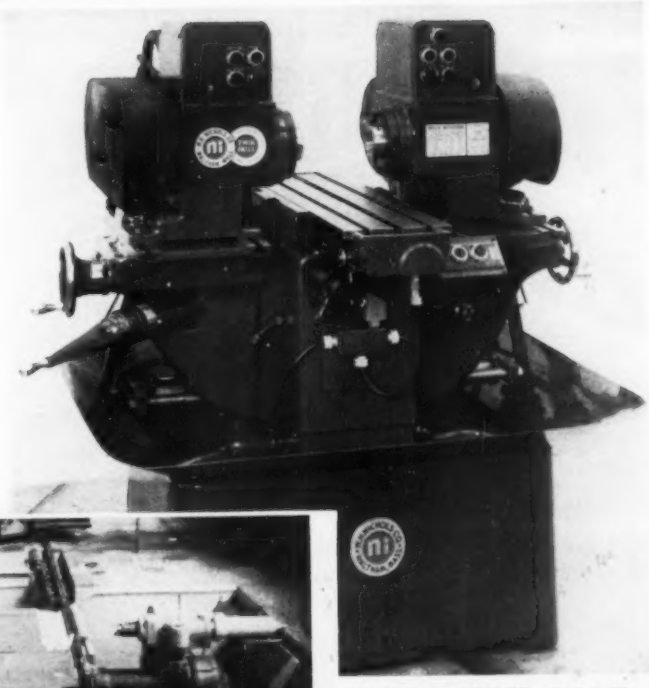
MILLING MACHINES—*Snyder Tool & Engineering Co., 3400 E. Lafayette, Detroit, Mich.* Machines two spherical gear seats inside a differential gear case. The malleable-iron workpiece is clamped automatically and automatically indexed into position for milling one side and then the other.

←

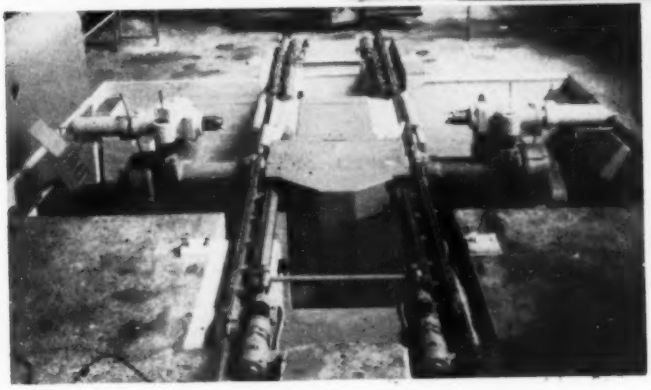
MILLER — *Wardwell Mfg. Co., 3167 Fulton Rd., Cleveland 9, Ohio.* Hydraulic automatic miller has been designed for fast, accurate milling of spiral and straight flutes. The spindle is fitted in a housing, which is mounted on a cross-slide swivel base on top of the vertical slide.



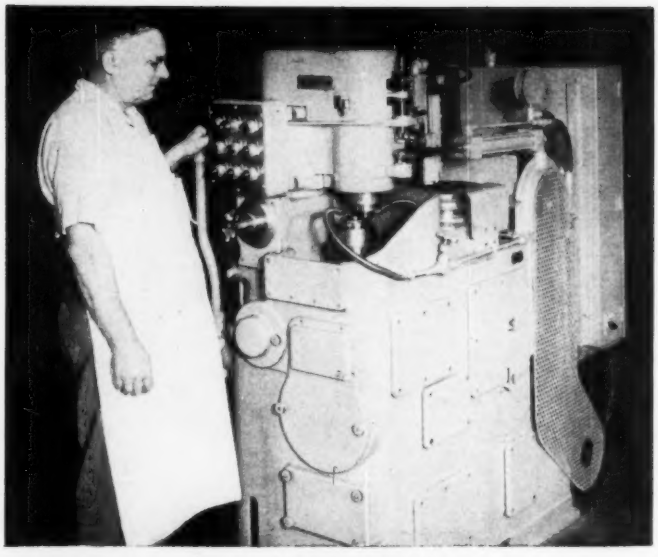
MILLERS—*Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wis.* A line of general-purpose knee-type milling machines, in plain and universal styles, has been announced. Principal features include sturdier columns and increased power ratings.



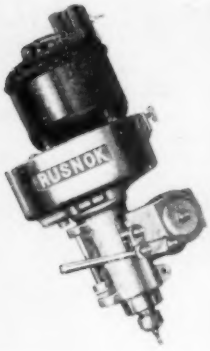
WHEEL TRUER—*Standard Railway Equipment Mfg. Co., 310 S. Michigan Ave., Chicago 4, Ill.* Worn wheels are restored to proper contour without removing them from the locomotive by this wheel-truing machine. It is able to recondition the wheels of a diesel by milling in less than one working shift, using two operators.



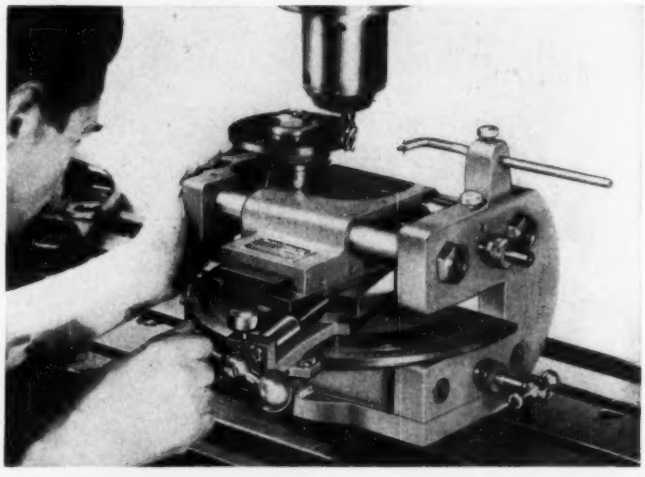
TWIN-HEAD MILLER—*Nichols-Morris Corp., distributor for W. H. Nichols & Sons, Waltham, Massachusetts.* For small-parts milling. Machines two or more surfaces simultaneously, requiring only one fixture and one operator. Automatic table drive is pneumatic, solenoid controlled, with trip and limit switches to govern table movement.



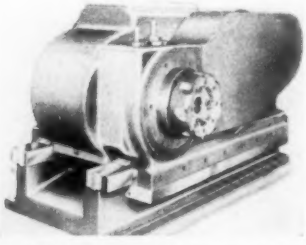
CONTOUR MILLER — *Sundstrand Machine Tool Co., Rockford, Ill.* The machine is controlled by a master cam and will handle work up to 5-in. dia. Cutter spindle and cam-follower spindle are mounted on a pivoting arm to give 2:1 vertical ratio, reducing cam errors to one-half on the finished part. ←



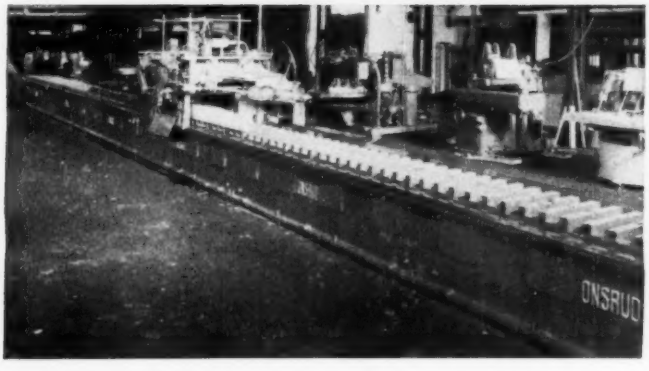
VERTICAL MILL ATTACHMENT—*Rusnok Tool Works, 4840 W. North Ave., Chicago 39, Ill.* Quill-travel attachment for bench, light floor, or heavy mills. It allows full use of table travel and features both single and compound angular settings.



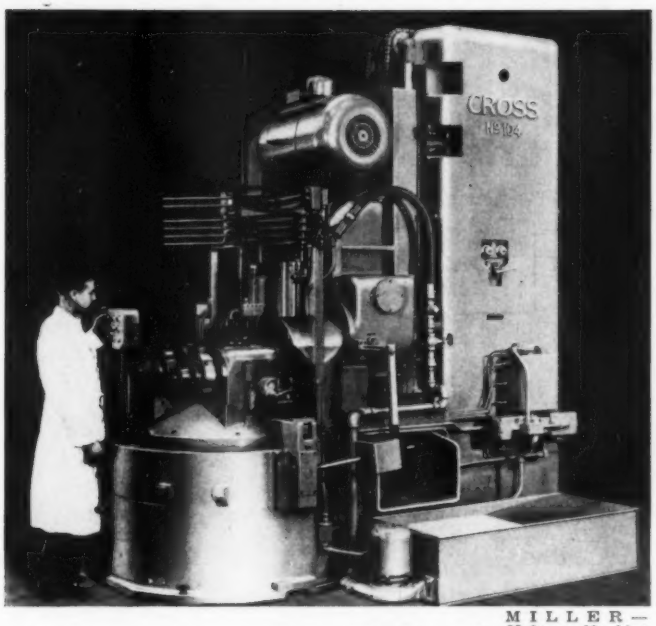
CAM-CUTTING ATTACHMENT — *Sheffer Collet Co., Traverse City, Mich.* Two important improvements in cam making are claimed for the Helix-Master. Through the geometric action of three compounded slides it assures lobes with a consistent rise through every 1/100 segment with no fast or slow intervals. ←



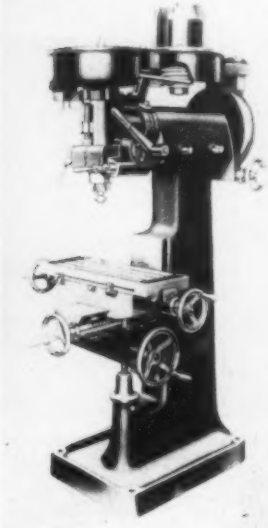
MILLING HEAD—*The Motch & Merryweather Machinery Co., Cleveland 13, Ohio.* All gears on the M-30 production milling head are integral or mounted solidly by taper and key to lock them in place in shafts.



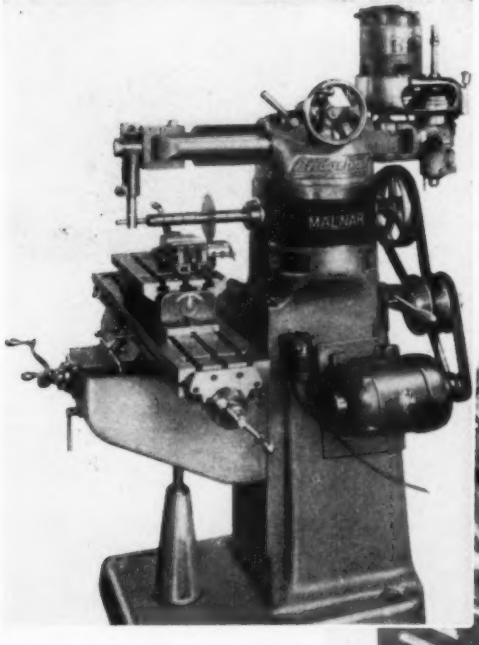
MILLER — *Onsrud Machine Works, Inc., Chicago, Ill.* For the machining of aluminum airplane spars, it has an over-all length of 105 ft. The carriage houses four cutter motors, two in a horizontal and two in a vertical position. ←



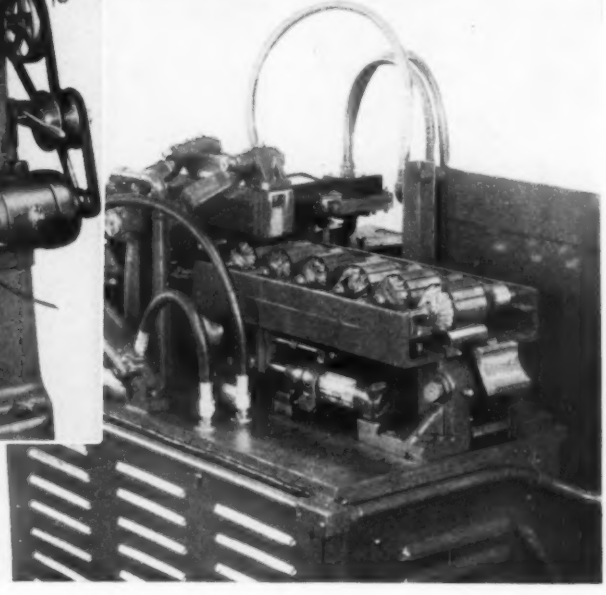
MILLING—*The Cross Co., Detroit 7, Mich.* Machine plunge mills three gear clearances on 85 front and 85 planet carriers per hr at 100% efficiency. Made possible by use of a two-station index table with two pieces being loaded at the first station, while two others are being milled at the second. ←



VERTICAL MILLER—*DCMT Sales Corp., 164 Duane St., New York 13, N. Y.* The C.V.A. No. 79 vertical milling and die-sinking machine headstock swivels 90° and there is a sliding adjustment of the spindle head, so that the machine can be used with simple tools and fixtures.



MILLER—*Malnar Machine & Tool Co., Inc., Cleveland, Ohio.* Horizontal unit was engineered to make the Bridgeport vertical miller universal, eliminating errors in resetting from vertical to horizontal operation. ←

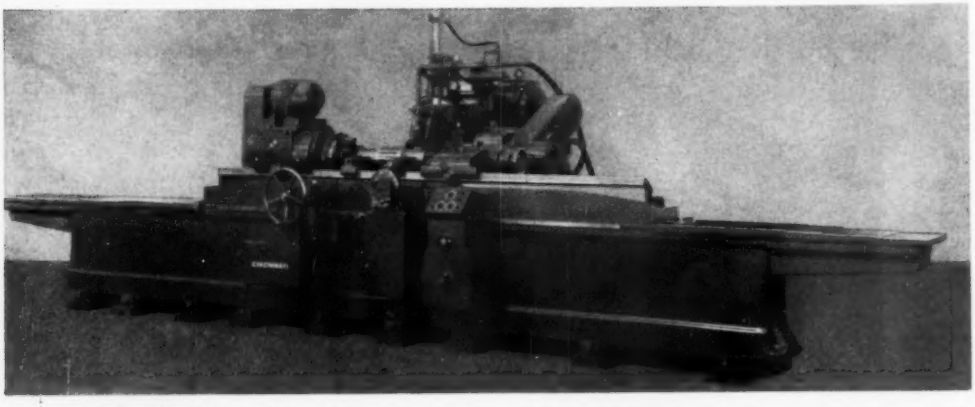


INDEXING MACHINE—*Pri Kar Engineering Sales Co., Detroit, Mich.* Mills mica slots on armatures for electric motors. Loading, feeding, positioning, and unloading mechanisms are operated by synchronized electric, magnetic, and pneumatic systems. →

AMERICAN MACHINIST 1951

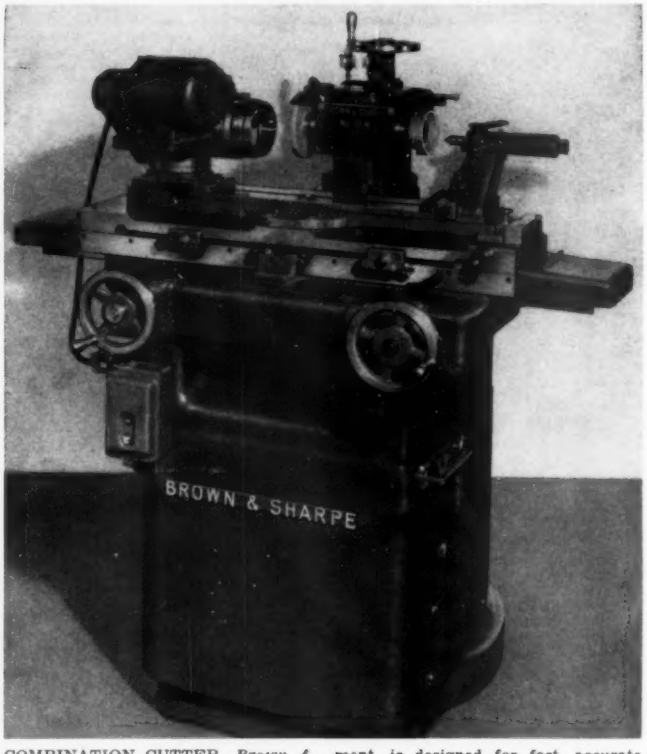
Grinding, Honing, Lapping

PRODUCTION PREVIEW

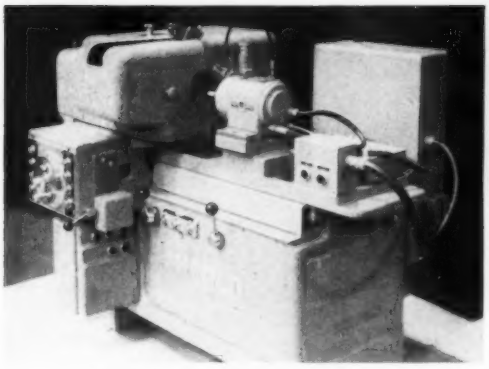


PLAIN - GRINDING MACHINES — *Cincinnati Grinders, Inc., Marburg Ave. Cincinnati 9, Ohio.* Plus traveling-table roll-grinding machines in three additional sizes, added to the Filmatic line. The sizes are 16-in. heavy-duty and 20- and 24-in. plain grinders; and 16-in., 20-in. and 24-in. roll grinders.

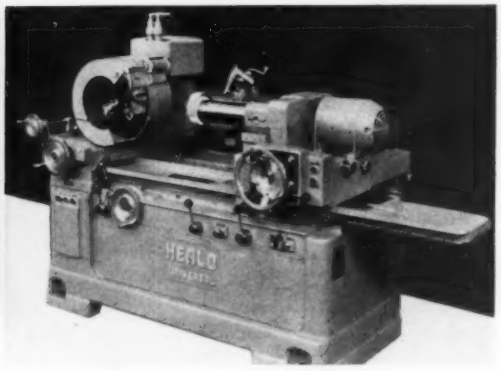
CUTTER AND RADIUS GRINDER—*Pratt & Whitney, Div. Niles-Bement-Pond Co., West Hartford 1, Conn.* Simplicity of design makes this machine quick to set up and easy to use. Longitudinal slides and cross-slides plus a vertical slide are said to make for exceptional maneuverability.



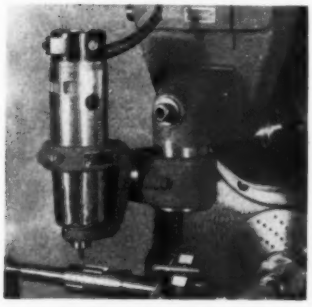
COMBINATION CUTTER—*Brown & Sharpe Mfg. Co., Providence, R. I.* Combined cutter and tool-grinding machine, No. 10N, is available in two models. One, with universal equipment, is designed for fast, accurate sharpening of tools, such as plain milling cutters. The other machine, with plain equipment, is for cutting and tool sharpening only.



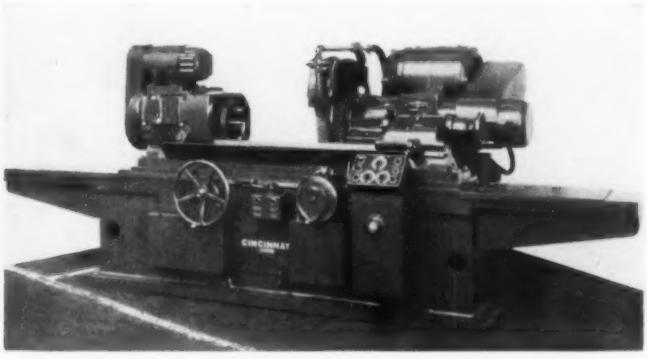
INTERNAL GRINDER—*The Heald Machine Co., Worcester, Massachusetts.* Model 180 centerless internal grinding machine is designed for battery installation with a central hydraulic system. Machines are completely automatic; several units can be tended by one operator.



GRINDER—*The Heald Machine Co., Worcester 6, Massachusetts.* Model 274 universal internal grinding machine is designed for toolroom work, but may be applied to production operations. Workhead can be swiveled up to 90° and is driven hydraulically.

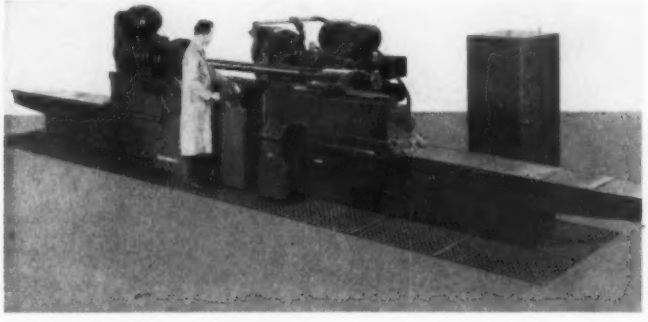


GRINDER-MILLERS—*Precise Products Co., 1328-30 Clark St., Racine, Wis.* A range of speeds from 20,000 to 45,000 rpm can be obtained. They are said to be capable of doing very close work at high speeds.



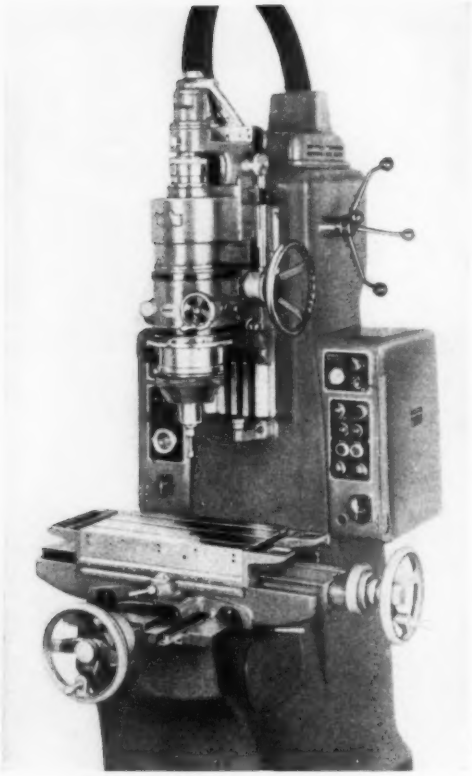
PLAIN GRINDING MACHINE—*Cincinnati Grinders, Inc., Cincinnati 9, O.* The grinding spindles of these 14- and 16-in. plain grinding machines run on Filmatic bearings. Bearing lubrication is automatic, with circulating filtered oil. It precedes spindle rotation and initiates starting by a pressure switch.

DRILL GRINDER — *William Sellers Div., Consolidated Machine Tool Corp., Rochester 10, N. Y.* Increased accuracy, reduced wear and further ease of operation is claimed for the improved No. 1G drill grinder.

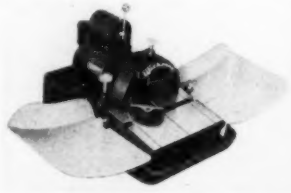


16-IN. GRINDER—*Cincinnati Grinders, Inc., Marburg Ave., Cincinnati 9, Ohio.* A center-type grinding machine with a gap table, for grinding locomotive piston rods and similar parts requiring additional swing for a large diameter of short length. In general, the machines have the same design features as Cincinnati Filmatic 14- and 16-in. plain grinding machines.

GRINDER—*Nife Inc., 165 Broadway, New York 6, N. Y.* Design changes in this universal precision grinder both increase the worktable size and foil the shop "junk piler." Experience with the earlier model indicated that flat table wings soon become catch-alls in the shop. Tapered table ends eliminate this temptation.

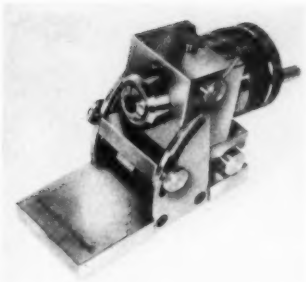


JIG GRINDER—*Moore Special Tool Co. Inc., Bridgeport 7, Conn.* Angular and indexing devices built into the main spindle of the No. 2 jig grinder and a slot-grinding attachment permit accurate grinding on any contour.

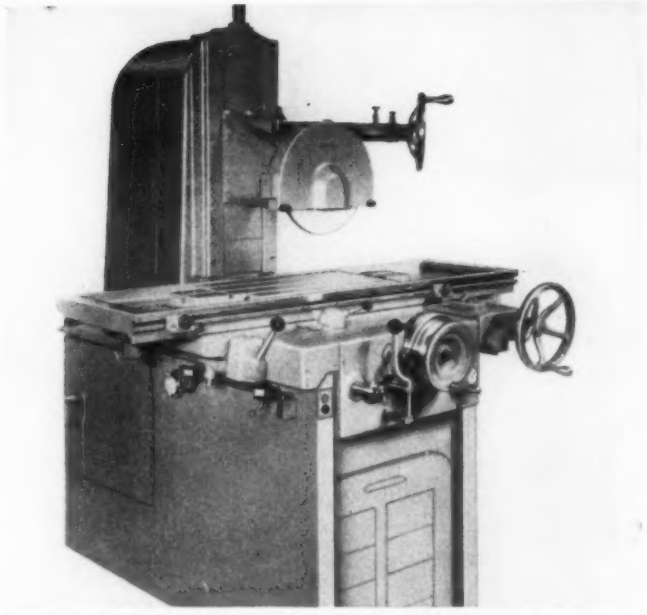


BENCH GRINDER — *Wickman Mfg. Co., 15533 Woodrow Wilson Ave., Detroit 3, Mich.* Machine enables use of silicon-carbide abrasive wheels as well as diamond wheels.

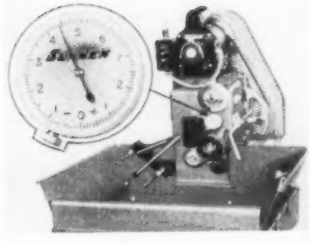
DIE GRINDER — *Pratt & Whitney, Div. Niles-Bement-Pond Co., West Hartford 1, Conn.* A grinder for facing new die blocks, reconditioning dulled impression edges, and preparing worn dies for resinking, as well as for regular surface grinding.



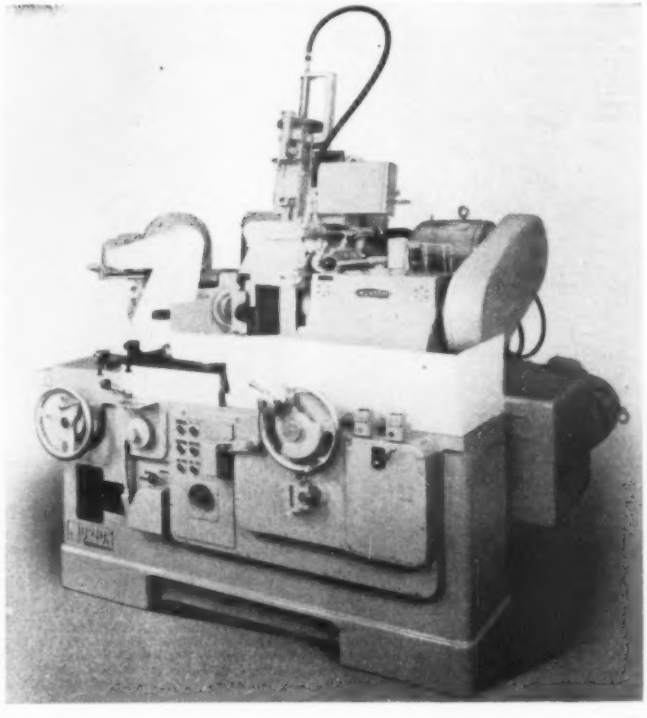
GRINDING FIXTURE — *Star Gauge Co., 261 Oak Grove Ave., Springfield 9, Mass.* Sta-Ga-Co attachment permits grinding of flats, cylindrical surfaces, tapers, slots, radiuses, and splines on a surface grinder. Incorporates a sine plate and a rotary index head with vernier.



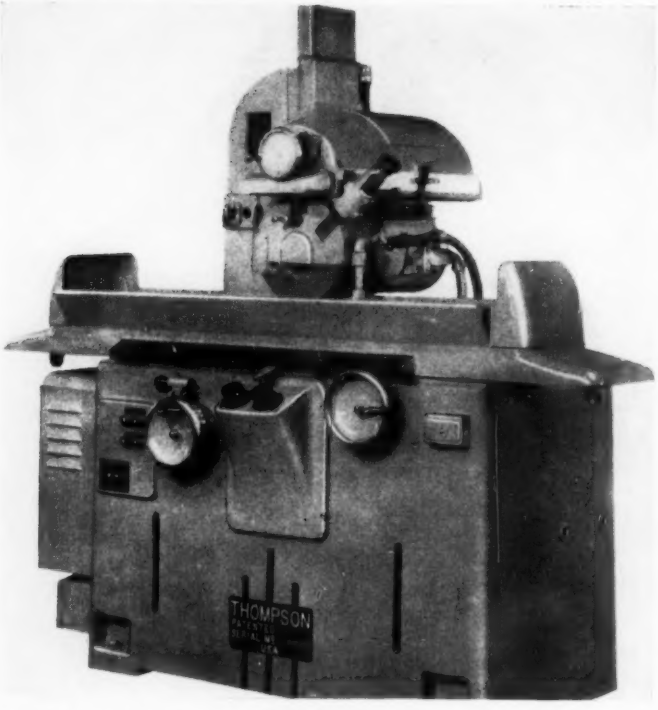
HYDRAULIC GRINDERS—*Abrasive Machine Tool Co., East Providence 1½, R. I.* First of a series of surface grinders with hydraulic operation is the No. 1218 Hydrabrasive. It has a wide crosstravel (12 in.) and a moderate table length (18 in.)



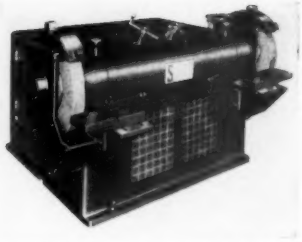
SIZE - CONTROL GAGE — *Sunnen Products Co., 7910 Manchester Ave., St. Louis 17, Mo.* Gage is actuated by the stone feed-up dial on a Sunnen honing machine. As the hole is honed larger the stone feeds up automatically. The gage shows how fast and how much the stone feeds up.



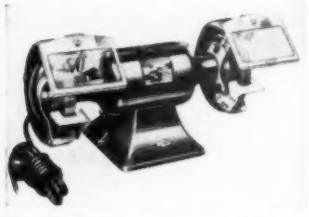
VALVE GRINDER—*Norton Co., Worcester, Mass.* Functions under semi-automatic control. Operating effort is confined to loading the machine and to movement of a single control lever. Movement of the lever clamps the workpiece in the workhead collet, starts the grinding cycle, rotation of the workpiece, and coolant flow.



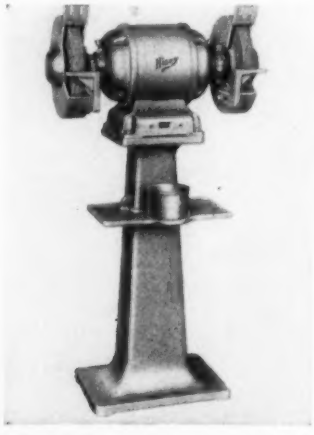
TOOLROOM GRINDER—*The Thompson Grinder Co., Springfield, Ohio.* High-precision toolroom grinder has 24-in. capacity of longitudinal work, 29-in.-max table movement, 8-in. traverse, and is 10 in. from the under side of the 12-in.-dia. wheel to table.



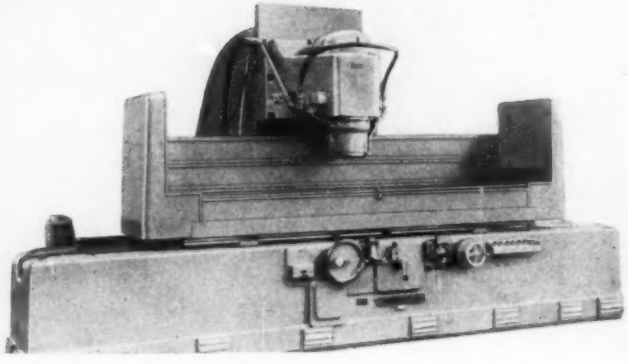
GRINDER—*Standard Electrical Tool Co., 2480 River Rd., Cincinnati 4, Ohio.* Twin-motor double-end grinder has a crank handle which simultaneously adjusts the guard and increases the spindle speed in direct relation to the amount of wear on the wheel.



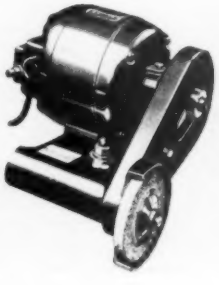
GRINDER—*Delta Power Tool Div., Rockwell Mfg. Co., Milwaukee 1, Wis.* One of the features of this 1/3-hp grinder is the shatter-proof-glass safety shields that fit over the wheels. Other safety features include a steel spark guard at the top of each wheel.



GRINDERS — *The Hisey-Wolf Machine Co., Cincinnati 8, Ohio.* Larger pedestal base designed into the Hisey Economy grinders, buffers, and polishers are said to reduce vibration to a minimum.

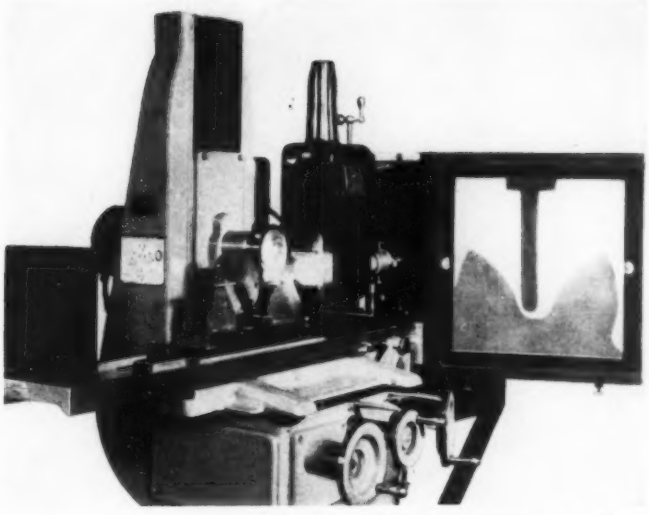


VERTICAL-SPINDLE GRINDER — *Thompson Grinder Co., Springfield, Ohio.* Complete line of surface grinders is composed of Hydrovert (sliding-column) machines and fixed-column grinders. In the Hydrovert the sliding column permits grinding close to shoulders, and in die grinding, to get around guide pins. The fixed-column grinders have reciprocating tables, and simplified circuits.

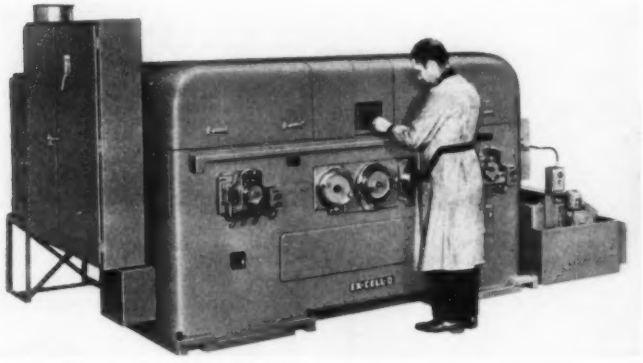


BENCH GRINDER—*The Dumore Co., Racine, Wis.* The Utility grinder is a dual-purpose toolpost and bench grinder which is said to be accurate to 0.0002 in. For external cylindrical grinding.

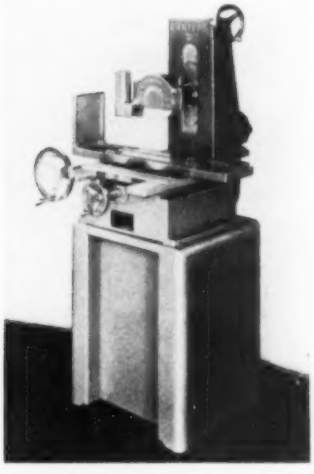
GRINDER — *Oliver Instrument Co., Adrian, Mich.* Ace tool and cutter grinder has the horizontal ram mounted on a series of ¾-in. balls contained in hardened and ground steel tracks. With this construction, only 6 oz of pressure are required on the operating hand lever to start the movement.



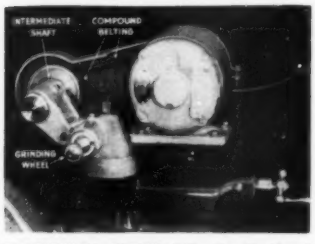
CONTOUR GRINDER — *The Cleveland Grinding Machine Co., 6514 St. Clair Ave., Cleveland 3, Ohio.* The Visual-Grind contour-grinding machine provides three techniques in optical contour grinding; image, profile, and templet. Four standard magnifications are available and capacity is 6x16x8 in. high using 7-in. wheel.



TWO-WHEEL GRINDER—*Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 32, Mich.* Simplifies the work of operators in high-production processing of jet-engine aircraft blades. The machine uses two 24-in. diamond-dressed grinding wheels which finish both sides of the root form simultaneously.



SURFACE GRINDER—*Sanford Mfg. Co., 1020-120 Commerce Ave., Union, N. J.* A block, die, part or unit up to 12 in. high may be finish-ground with a 7-in.-diameter wheel in this surface grinder. V-type slides, ground and lapped, are used.



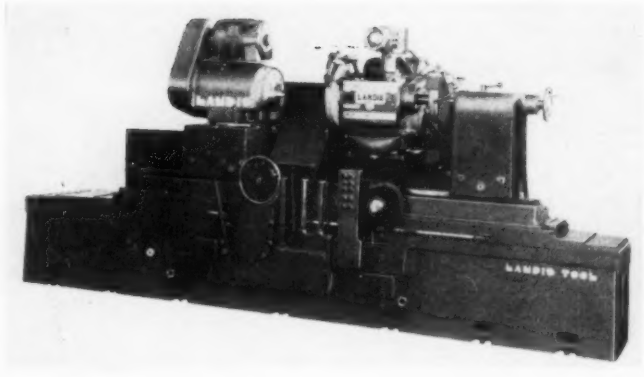
INTERNAL GRINDER—*South Bend Lathe Works, South Bend 22, Ind.* This internal-grinding attachment is powered by a standard, constant-speed, 1/6-hp, 3450-rpm, ac motor which is claimed to be far superior to the universal-type ac-dc motors ordinarily used.

TOOL GRINDER — *The Standard Electrical Tool Co., 2488-96 River Road, Cincinnati 4, Ohio.* The parallel-spindle design of these grinders saves floor space since the grinder may be located against the wall. Stationary tables tilt to the angle required.

SURFACE GRINDER—*Airborne Accessories Corp., 25 Montgomery St., Hillside 5, N. J.* The Dupliform surface grinder incorporates a profiling wheel dresser which permits dressing of the wheel directly from a sample part when grinding either male or female portions of a die, tool, or gage.

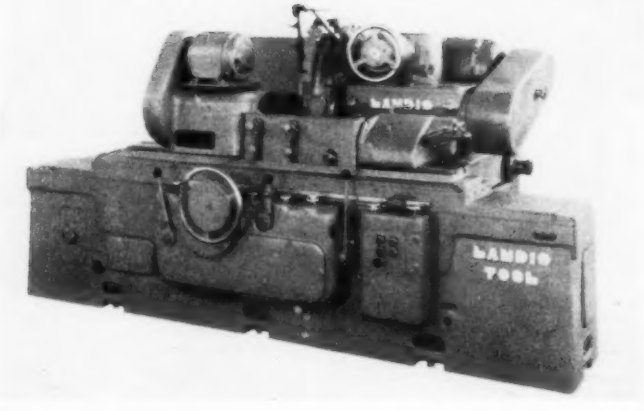
UNIVERSAL GRINDER—*Landis Tool Co., Waynesboro, Pa.* The CH 10x24-in. grinder is equipped with a swinging - type internal - grinding fixture which was previously available only on the 12-in. universal. It enables a ←quick changeover to be made.

GRINDING APPARATUS — *Cosa Corp., Chrysler Bldg., 405 Lexington Ave., New York 17, N. Y.* The precision double-cone bronze bearing and pulley arrangement in the middle of the grinding spindle is said to insure a uniform load on both bearings.



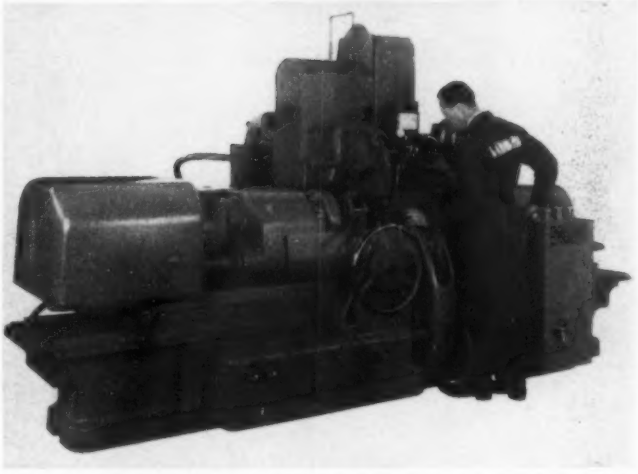
UNIVERSAL GRINDER—*Landis Tool Co., Waynesboro, Pa.* Large-diameter work such as turbine shafts, large motor armatures, and similar parts can be handled by this grinder. Known as the CHW, the wheelbase, headstock, and worktable may be swiveled. Dual controls are available so that the machine may be operated from the front ←or rear.

BENCH GRINDER—*Charles H. Besly & Co., Beloit, Wis.* This vertical-spindle grinder, designated as No. 318-18 in., has an approximate weight of 575 lb., complete with its 8-in.-diameter abrasive wheel. Its compact construction is claimed as a major advantage.

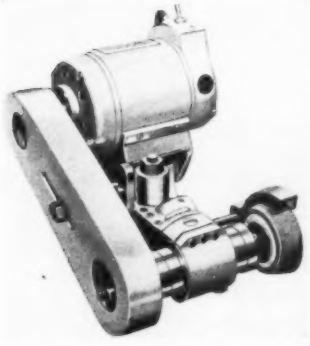


CYLINDRICAL GRINDER — *Landis Tool Co., Waynesboro, Pa.* Line of 10- and 14-in. plain and semi-automatic grinding machines is designed to preserve the alignment of the ways and provide a rigid foundation. Lengths between centers of 18, 36, 48, 72, 96, ←and 120 in. are available.

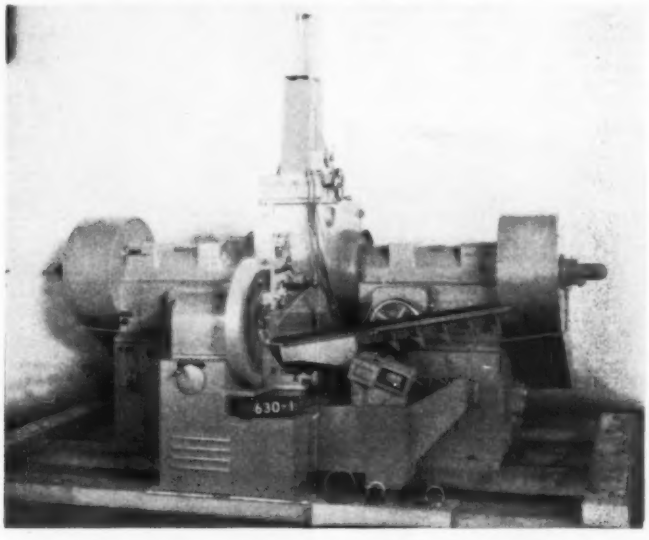
PROFILE GRINDING ATTACHMENT—*Nife Inc., 165 Broadway, New York 6, N. Y.* Mounting of this optical unit on the Nife US-21 grinder requires ten minutes and makes both a tool grinder and a profile grinder available in one machine.



CRANK-PIN GRINDER—*Landis Tool Co., Waynesboro, Pa.* Available in swings of 16 or 25 in. and in lengths to accommodate 32-, 42-, and 72-in. crankshafts. An improved model, lubrication to the carriage and wheelbase ways is from a separate reservoir with pump and filter.



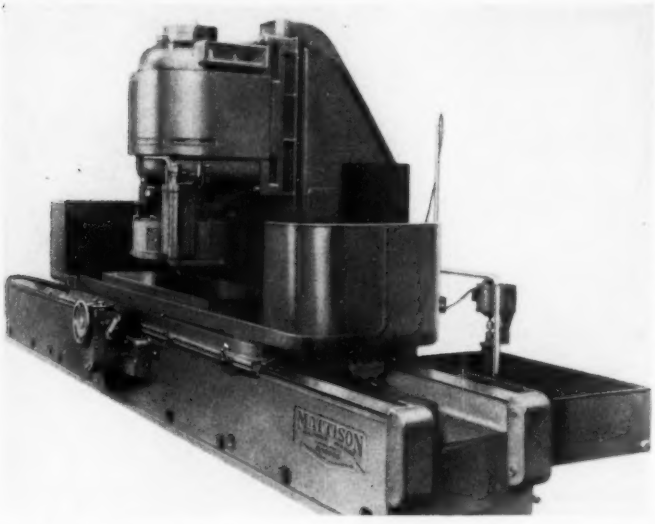
TOOLPOST GRINDER—*K. O. Lee Co., Aberdeen, South Dakota.* A toolpost and thread grinder for external, internal, surface, and thread grinding. Can be used on most standard machine tools having a T-slot mount.



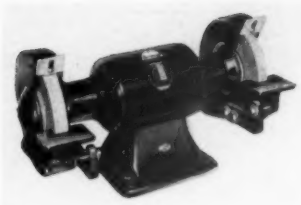
PISTON-RING GRINDER — *Gardner Machine Co., Beloit, Wis.* The No. 630-30-in. requires a minimum of time for changeover between ring sizes. A variable-speed feeder on the front of the machine uses a rotating magnetic disk which picks off rings from an inclined vibrating trough.

CARBIDE-TOOL GRINDER — *Wickman Mfg. Co., 15531 Woodrow Wilson Ave., Detroit 3, Mich.* Bench-type tool grinder, designed especially for use with diamond wheels, can be employed as a surface grinder, a chip-breaker grinder, or a universal tool and cutter grinder.

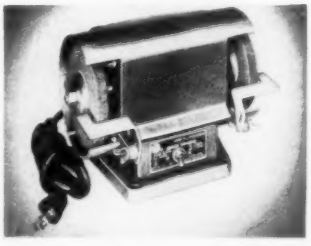
←
GRINDER—*Samuel C. Rogers & Co., 191 Dutton Ave., Buffalo 11, N. Y.* The Type SC grinder handles any carbide-tipped circular saws from 4- to 20-in. dia and larger ones on special order. It grinds with both rough and finish cuts, the top, face, and side of each carbide tip.



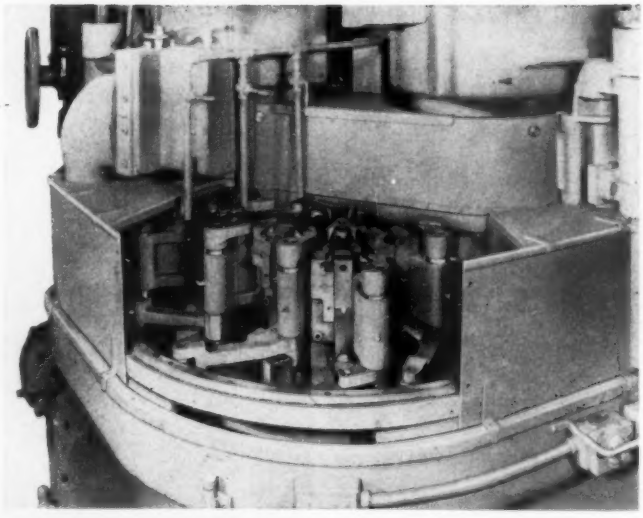
SURFACE GRINDER—*Mattison Machine Works, Rockford, Ill.* With vertical spindle, and equipped with a 100-hp motor. The machine is in operation in one of the automotive plants reconditioning large-size dies. The motor is said to be the largest ever to be used in this connection.



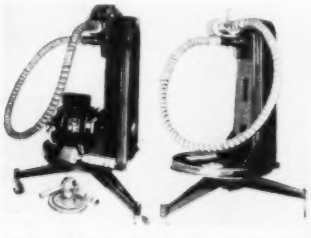
BENCH GRINDERS—*Cummins Portable Tools Div., Cummins Business Machines Corp., 4746 Ravenswood Ave., Chicago 40, Ill.* Four grinders offered are respectively: Model 470, 6-in. grinder, close coupled, ¼-hp motor; Model 471, 6-in. grinder, long end bell, ¼-hp motor; Model 475, 6-in. grinder, long end bell, 1/3-hp motor; Model 478, 8-in. grinder, long end bell, ¾-hp motor.



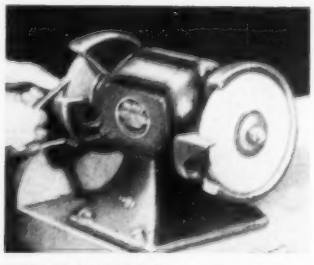
BENCH GRINDER — *Portable Electric Tools Inc., 320 W. 83rd St., Chicago 20, Ill.* Known as the Model 400 Hi-Power, this portable unit incorporates a fan-cooled single-phase 3500-rpm motor with a balanced rotor.



SURFACE GRINDER—*Mattison Machine Works, Rockford, Ill.* Has two spindles and a special fixture for grinding sides of connecting rods. Pieces are first rough-ground, after which they are checked by an automatic sizer. Pieces then pass under a fine-grained wheel and are checked again.

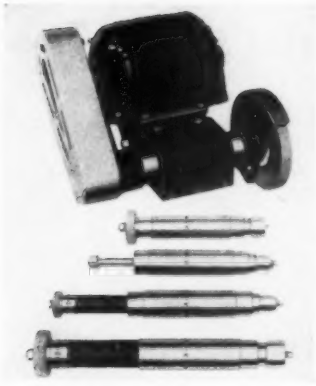


FLEXIBLE-SHAFT GRINDER—*Wyzenbeek & Staff, Inc., 820 W. Hubbard St., Chicago, Ill.* By employing 3- or 4-step V-pulleys to facilitate speed selection, the range of this flexible-shaft equipment has been increased. A locking clamp holds the handpiece firmly for stationary grinding.

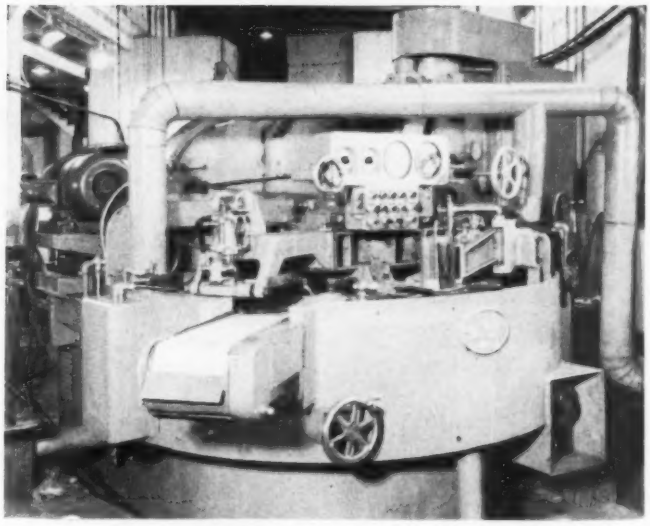


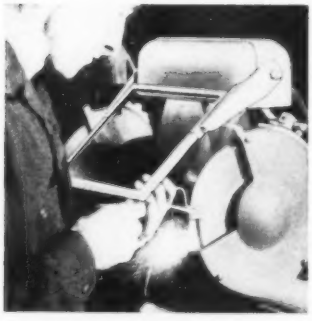
BENCH-GRINDER — *Skilsaw, Inc., 5033 Elston Ave., Chicago 30, Ill.* Skil ¼- and 1/3-hp grinders are "flat-faced" to provide full clearance for difficult jobs.

ABRASIVE-BELT GRINDER—*H. L. Ramsay Co., P. O. Box 51-A, LaGrange, Ill.* Portable grinder is instantly adjustable to any angle to give operator full view and control. It is able to swivel 360°.

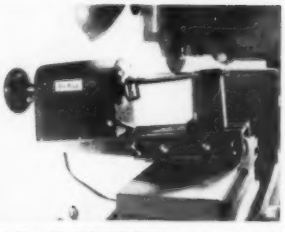


GRINDER SPINDLES—*The Maxwell Co., 300 Broadway, Bedford, Ohio.* High-speed precision grinding spindles for standard grinders doing external or internal work. Of Fafnir-bearing construction throughout.





SAFETY SHIELD—*Junkin Safety Appliance Co., Inc., 930-36 West Hill St., Louisville 8, Ky.* Mercury switches on the Electro-Lock safety shield control electrical circuits to both the shield's lights and to the starting switch. The latter insures that the machine will not start when the shield is out of a completely protective position.

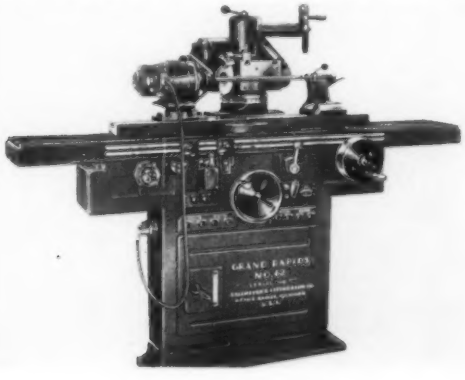


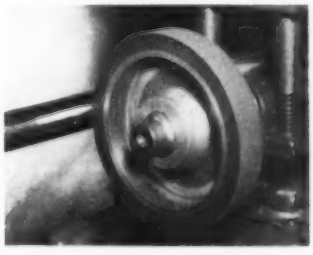
SURFACE GRINDER — *The DoAll Co., Des Plaines, Ill.* The attachment is equipped with a two-way sine-bar tilt arrangement which allows taper work up to 45°. Cylindrical work up to 6½-in. swing and 7⅛-in. between centers.

CUTTER AND TOOL GRINDER—*Gallmeyer & Livingston Co., Grand Rapids, Mich.* Two table movements are fixed on this type Model 62. A cabinet-base machine with many operational features such as anti-friction ball-bearing table.

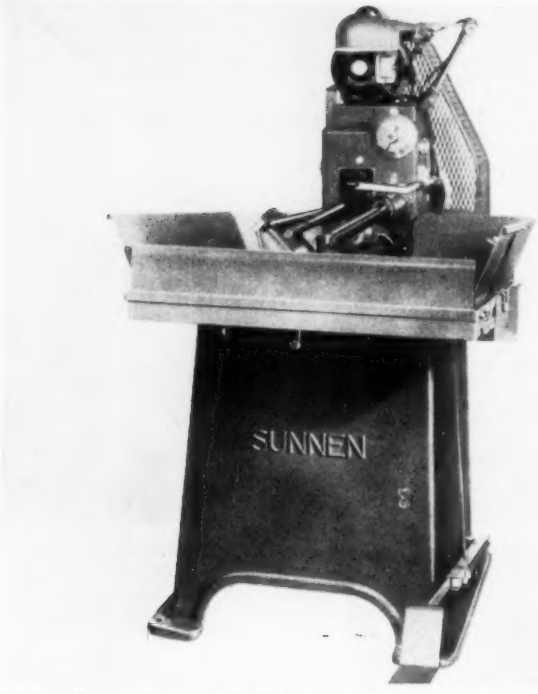
SERRATOR GRINDER—*Charles H. Besly & Co., Beloit, Wis.* Model 224 produces serrated sections and ledger plates for farm implements. Two single-spindle grinder heads progressively bevel and serrate the units.

ADAPTER BASE—*E. F. Hager and Son, Queens Village, N. Y.* Embodying the Hager's reciprocating action, this adapter base converts almost any bench grinder into an accurate carbide-grinding machine. The action is said to produce a smooth cutting edge, prolong tool life.

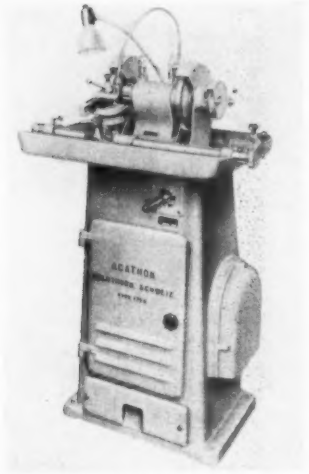




DRUM SANDER—*American Diamond Saw Sales, 120 N. W. Ninth Ave., Portland, Oregon.* Drum sander is split and hinged permitting use of coated abrasive strips without troublesome and expensive joining at the ends of belts.



WET-HONER—*Sunnen Products Co., St. Louis 17, Mo.* The machine spindle of the Model MBB is mounted on precision ball bearings, preloaded, and sealed with life-time lubrication. Spindle chuck is provided with centering adjustments to eliminate "runout" of the honing mandrel and work.

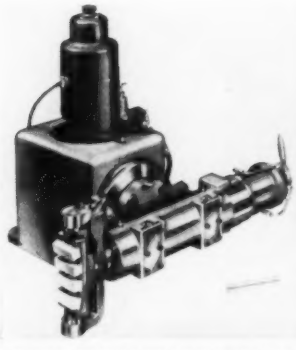


GRINDER AND LAPPER — *Hauser Machine Tool Corp., 30 Park Ave., Manhasset, N. Y.* Tool to be ground is held in a compound holder which slides on a bar parallel to the wheel spindle. After grinding it is only necessary to move the holder to the lapping wheel for the final finishing job.

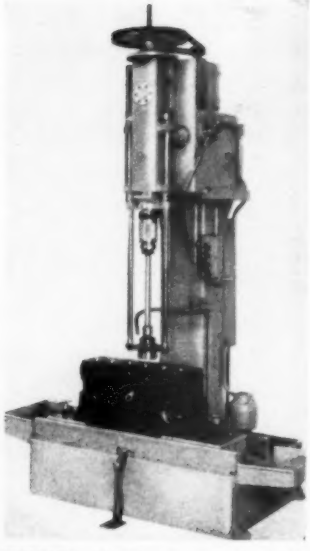
EXTERNAL HONE — *Sunnen Products Co., New Products Dept. 1, 7910 Manchester, St. Louis 17, Missouri.* Series of tools for sizing and finishing external diameters covers a range from ½ to 2¾ in. They have micrometer feed-up, fingertip control, and a steel arm to absorb torque.

HAND LAPPER — *The Taft-Peirce Mfg. Co., Woonsocket, R. I.* Lapping plates for this machine are 24 in. in dia and are furnished either plain for cylindrical work or grooved for flat work. Of close-grain cast iron, they are heat-treated to prevent distortion from seasonal changes.

DIAMOND LAPPING COMPOUND—*Ace Abrasive Laboratories, Inc., 250 W. 57th St., New York 17, N. Y.* For finishing of most hard-metal precision parts, it is claimed that only two or three grit sizes of Star Dust compound will take care of most requirements.



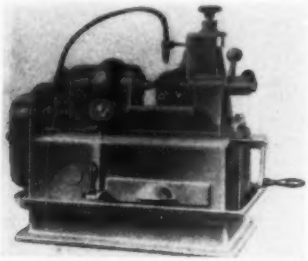
SUPERFINISH ATTACHMENT—*Gisholt Machine Co., Madison 10, Wis.* Gisholt No. 4 is a heavy-duty attachment to be used for either cylindrical or flat work wherever large areas are to be covered.



HONING MACHINE — *Micromatic Hone Corp., Detroit, Mich.* Heavy-duty honing machines, said to have all the performance features of a production machine, hone any bore from 1- to 4-in. dia. and up to 10 in. in length. All controls of the movement of the hydraulically reciprocated head are on a Uni-Control lever.

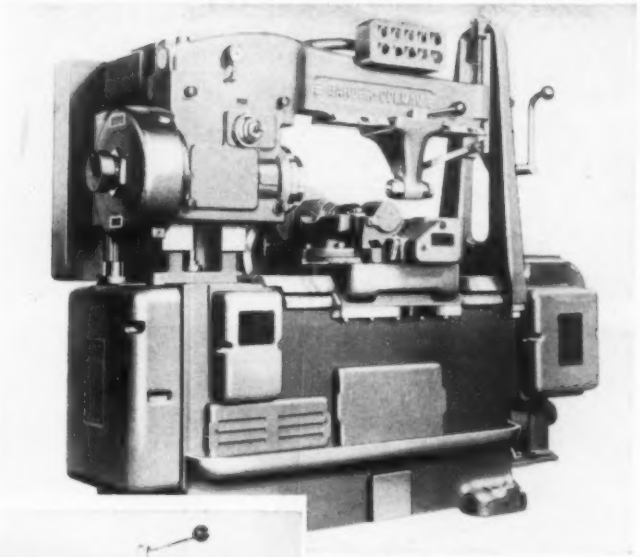
AMERICAN MACHINIST 1951 PRODUCTION PREVIEW

Gear Cutting and Finishing

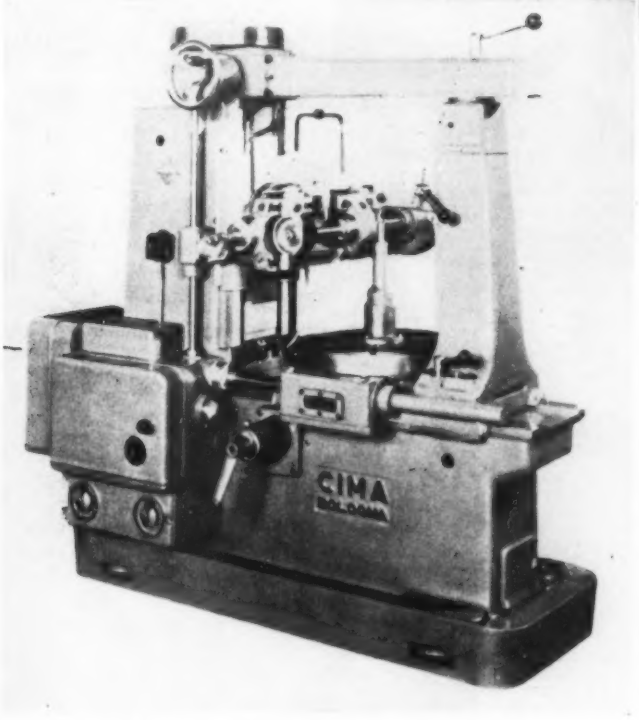


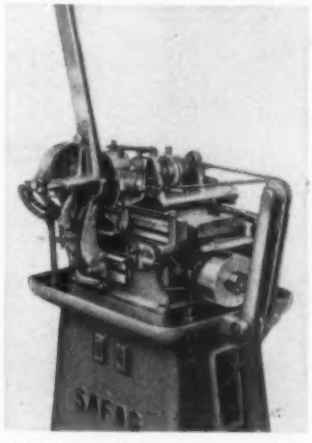
HOBBER — *George Scherr Co., 200 Lafayette St., New York, N. Y.* Koepfer automatic machines small gears and pinions for precision instruments. The cutter is driven from the main drive by exchangeable silk-belt pulleys, allowing for eight different speeds.

GEAR HOBBER—*George Scherr Co., Inc., New York 12, N.Y.* The cutter head of this universal machine is provided with a slide which feeds the tapered hob tangentially. This method is said to generate worm gears with multiple threads but avoids ridges and flats on the side of the teeth. ▼

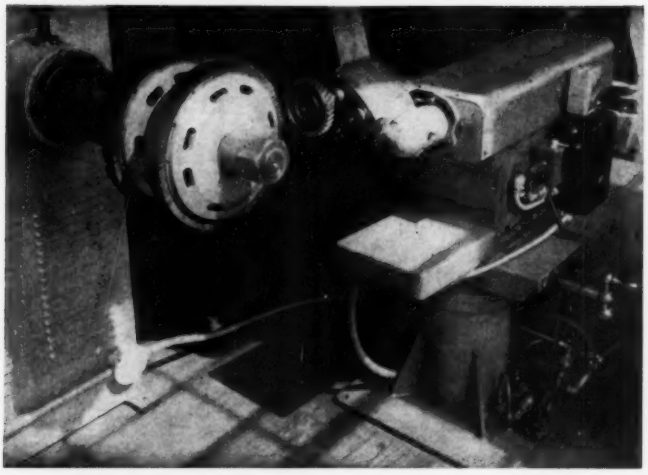


HOBBING MACHINE — *Barber-Colman Co., 1302 Rock Street, Rockford, Ill.* Automatic hob shifter is available as extra equipment on the 16-16 hobbing machine. It is a mechanical unit, electrically actuated to shift in increments as small as 0.0026 in.



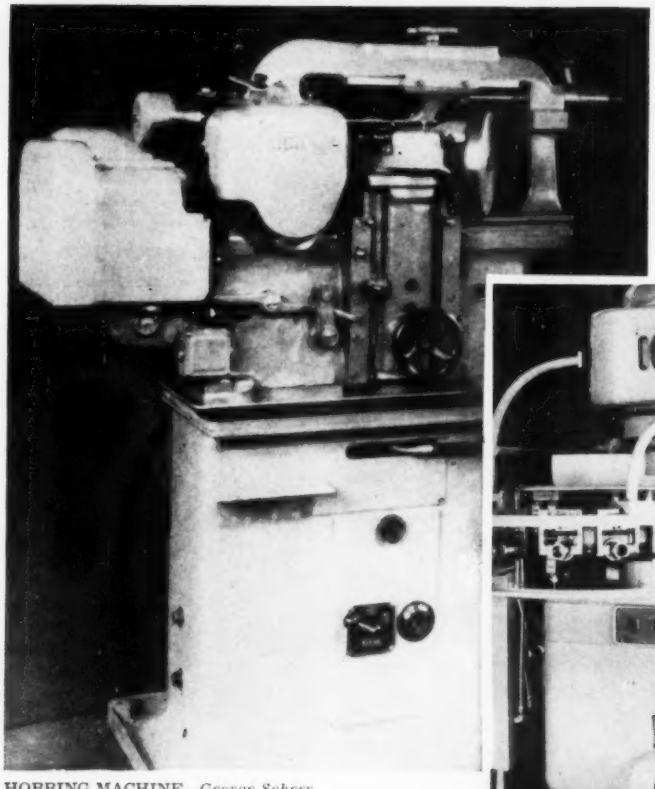


GEAR CUTTER — *Hauser Machine Tool Corp., 30 Park Ave., Manhasset, N.Y.* Swiss wheel-, pinion-, and segment-cutting machine is for precision production of parts ranging from 0.04- to 2.0-in dia. Two cutters, one for roughing and one for finishing, assure close tolerances.



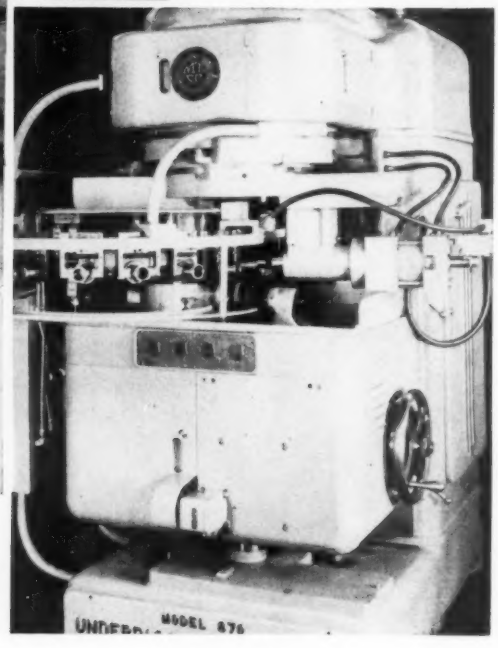
GEAR DEBURRING — *The Osborn Manufacturing Co., Cleveland, Ohio.* Development uses a semi-automatic universal workpiece holder and brushing lathe to deburr gears. ←

CHAMFERING MACHINES — *Sheffield Corp., Dayton, Ohio.* High-speed precision deburring and chamfering machine handles spur or helical gears as well as multiple-start worms up to 7-in. dia. The machine can be obtained with either single or multiple stations.



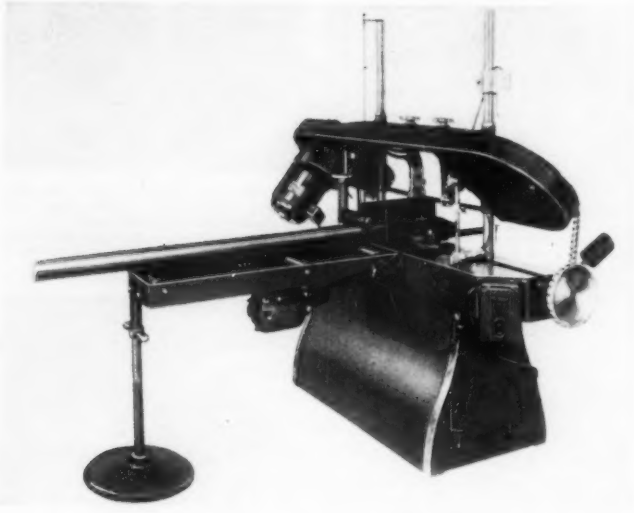
HOBBING MACHINE—*George Scherr Co. Inc., New York 12, N.Y.* Koepfer gear-hobbing machine is for spur, spiral, and worm gears from 3/16- to 4¾-in. dia., 82 to 12 dp. Equipped for hobbing small - diameter multiple-thread worms.

GEAR FINISHER — *Michigan Tool Co., Detroit, Mich.* This automatic system is made possible by passing the work conveyor through the machine instead of by it. The arrangement permits the use of individual or multiple No. 870 rotary gear-finishing machines.



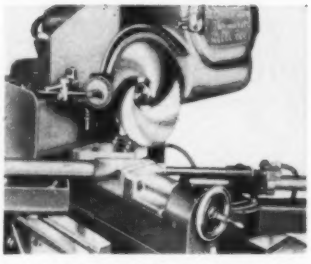
AMERICAN MACHINIST 1951 PRODUCTION PREVIEW

Cutoff and Filing

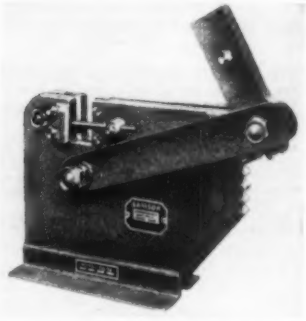


BANDSAW — *W. F. Wells & Sons, Three Rivers, Mich.* Hydraulic control on this cutter can be set to automatically raise the machine at the completion of a cut and start down again without stopping the blade.

CUTOFF MACHINE — *O'Neill-Irwin Mfg. Co., Lake City, Minn.* The Power Parter is claimed to accurately cut off rods and bars without distorting their roundness or crushing the material.

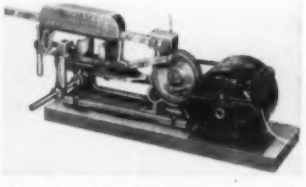


SAWING MACHINES—*Motch & Merryweather Machinery Co., 715 Penton Bldg., Cleveland 13, Ohio.* Square or angular cutting off can be done by machine. Capacity is up to 3-in. round or square pieces of either ferrous or non-ferrous materials.



BAR CUTTER—*Julius Blum & Co. Inc., 532-540 W. 22nd St., New York 11, N. Y.* The knives are located at the top of the Samson hand-lever bar cutter; a location which enables a number of bars to be laid down on top of the machine and then dropped in one by one.

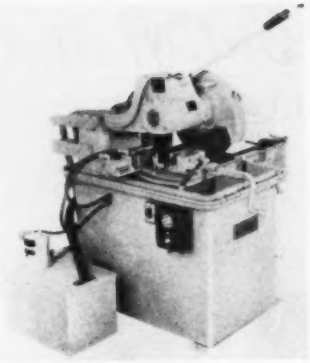
ABRASIVE CUTOFFS — *The Tabor Mfg. Co., 6225 Tacony St., Philadelphia 35, Pa.* Available in floor or bench models, this 3-hp machine handles right-angle to 45° bevel cuts, wet or dry operation.



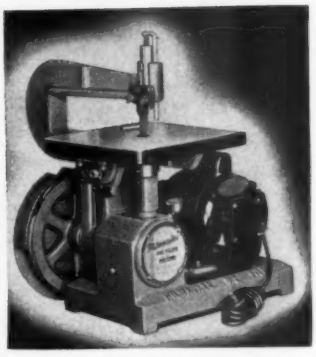
POWER HACK SAW—*Sales Service Machine Tool Co., 2362 University Ave., St. Paul 4, Minn.* The portable Jefferson 601 power hack saw has been redesigned to accurately cut material up to 3½x3½ in. and permit angle cutting of 2⅝-in. material up to 45°.

HACK-SAWING MACHINE — *Armstrong Blum Mfg. Co., 5700-5800 W. Bloomingdale Ave., Chicago 39, Ill.* Modification of the Series 6A and 9A Marvel automatic hack-saw machine combine both fully-automatic and semi-automatic bar pushup to attain a fully universal machine.

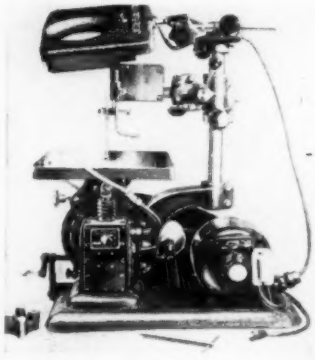
BANDSAW WHEEL TIRE — *The Carter Products Co., Grand Rapids, Mich.* Made in sizes to fit any bandsaw wheel, the Jiffy tire is installed without the use of cement, glue, rims, bolts, or special tools.



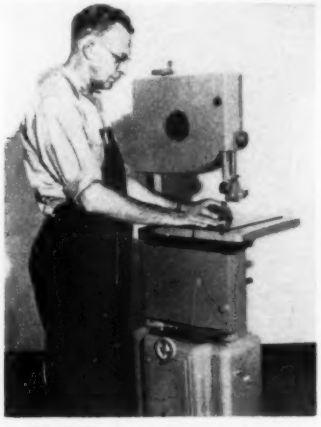
CUTOFF MACHINE—*Stone Machinery Co. Inc., 535 Fayette St., Manitius, N. Y.* An improved method of adjusting depth of cut has been added to the Swing-Cut in the form of a wheel depth control which is arm operated from the operator's normal position.



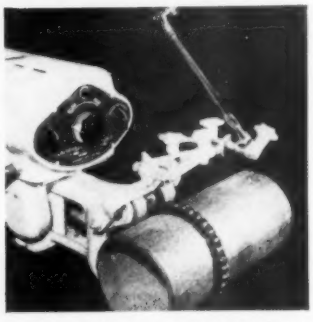
DIE FILERS—*Rice Pump & Machinery Co., Milwaukee 15, Wis.* To bring the table back to a horizontal or lev position, Milwaukee die filers are using dowel pins through matching holes in the pivot bracket.



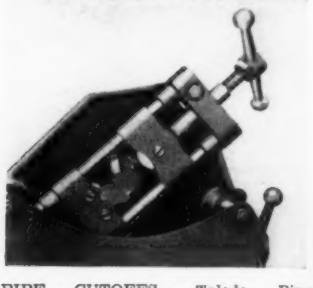
DIE-FILING MACHINE—*All American Tool & Mfg. Co., 1014 Fullerton Ave., Chicago 14, Ill.* A universal-joint file clamp and file-setting square on the Model 1500-SR machine assures 100% vertical file position. Infinite speed changes within the range of 170 to 470 strokes per min are obtained with the manual speed-control device.



BANDSAW—*Tyler Mfg. Co., Los Angeles 45, Calif.* The spiral blade on this Tyler bandsaw presents a 360° cutting edge which cuts smoothly in any direction, permitting the operator to cut and back out.



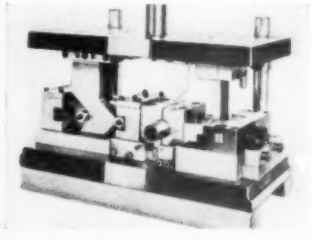
PIPE-SCARFING ATTACHMENT—*Roylyn, Inc., 718 W. Wilson Ave., Glendale 3, Calif.* This accessory is said to provide an economical means of accurately cutting or scarfing pipe and tanks while they are being turned by a Kinmont power unit.



PIPE CUTOFFS — *Toledo Pipe Threading Machine Co., Toledo, Ohio.* A choice of either wheel and roller cutoff, or knife cutoff is offered on the Toledo No. 999 pipe machine. The cutter head is equipped with two rollers and one cutter wheel. Also furnished with four cutter knives.

DRAWN-SHELL TRIMMER — *Dayton Rogers Mfg. Co., Minneapolis, Minn.* Universal machine will trim drawn shells of practically any depth up to and including 16-gage material, with minimum radii on irregular shells.

METAL-CUTOFF BANDSAW — *Famco Machine Co., Racine, Wis.* Model 612 metal-cutoff bandsaw employs a 5/4-x0.032-in. blade and is capable of 15-, 100-, 175-, and 300-fpm cutting speeds. It handles capacities up to 6-in. round and 6x12-in. rectangular stock.



TUBE-CUTOFF—*Vogel Tool & Die Corp., 2527 W. Moffat St., Chicago, Ill.* An arrangement of both horizontal and vertical blades on this shear facilitate cutting up to 6000 pieces per hr while maintaining accuracy to 0.004 in. in tube length.

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NEW BULLETINS

MACHINES AND ATTACHMENTS

1 GRINDERS—*Landis Tool Co., Waynesboro, Pa.* 26-page catalog describes and illustrates 10- and 12-in., Type CH, hydraulic universal cylindrical grinders. Specifications are included.

2 ACCESSORIES—*Benco Collet Mfg. Co., Cleveland 14, Ohio.* 20-page catalog features collets, pushers and pads among other items. A collet No. versus machine make table and specifications are included.

3 KEYSEATERS — *National Machine Tool Co., Cincinnati, Ohio.* 23-page catalog No. 17 gives details on millers for key seating and oil grooving. Includes a table on recommended speeds and feeds and operating instructions.

4 LATHE—*Hardinge Brothers Inc., Elmira, N. Y.* 6-page bulletin on the new Model HLV which is claimed to fill the gap between a plain bench lathe and a heavy-duty engine lathe. Includes specifications.

5 TUBE BENDING—*Wallace Supplies Mfg. Co. Chicago 14, Ill.* 58-page catalog illustrates and describes bending machines, saws, shears and cutters, pipe and tubing, and specialized parts and materials. Includes much engineering information.

6 BROACH SHARPENERS — *Colonial Broach Co., Detroit 13, Mich.* 4-page bulletin covers universal machines that will handle both round and flat broaches. Six machines are included with standard and accessory equipment.

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FYI — For Your Information

FREE details about new machines & tools
FREE data on new materials or parts
FREE shop calculators and data sheets
FREE information from advertisers

HEAT-TREATING AND WELDING

7 BRONZE ELECTRODES — *Ampco Metal, Inc., Milwaukee 46, Wis.* 24-page bulletin includes information on bronze electrodes, recommended welding techniques and procedures, and machining suggestions.

8 HEAT-TREATING—*Surface Combustion Corp., Toledo 1, Ohio.* 1st issue of a publication called the "Heat Treat Review" which will present current information on heat-treating metallurgy and practice.

9 ALLOYS AND FLUXES—*All-State Welding Alloys Co., Inc., White Plains, N. Y.* 32-page guide to a line of alloys and fluxes for welding, brazing, soldering, cutting, and tinning.

10 FURNACES — *Surface Combustion Corp., Toledo, Ohio.* 4-page bulletin describes pit-type furnaces for controlled-atmosphere heat-treatment. Performance data, construction features, and applications are covered.

11 WELDING ALLOYS — *Eutectic Welding Alloys Corp., New York 13, N. Y.* 6-page folder to be used as a wall chart gives complete specifications on 100 alloys used in welding, brazing, and hard surfacing.

PLANT SERVICE EQUIPMENT

12 CONVEYOR BELTS—*B. F. Goodrich Co., Akron, Ohio.* 26-page catalog section illustrates and describes conveyor and elevator belts. Includes specifications.

13 HOISTS—*Joy Mfg. Co., Pittsburgh, Pa.* 16-page bulletin covers a line of single-drum, multiple-purpose hoists with capacities from 500 to 3500 lb. Contains specifications and a selection chart.

14 CLEANERS — *Detrex Corp., Detroit 32, Mich.* Folder describes a series of emulsion cleaners which are said to remove both oil-soluble and water-soluble grime from any metal or alloy without attacking the base metal.

15 FORK TRUCK—*The Mercury Mfg. Co., Chicago, Ill.* 4-page bulletin describes a new 2000-lb Model-230 fork truck. Includes specifications and drawings.

16 BLAST CLEANING — *American Wheelabrator & Equipment Corp., Mishawaka, Ind.* 4-page bulletin contains case studies of how this method of airless blast cleaning has been applied prior to enameling.

PARTS AND MATERIALS

17 HIGH-TEMP. ALLOYS — *Haynes Stellite Div., Union Carbide and Carbon Corp., Kokomo, Ind.*, 96-pages of technical data on 10 alloys for high-temp. service, including 2 new cobalt-base alloys. Includes 9 pages of graphs comparing the mechanical properties of the various alloys.

18 FASTENERS — *Continental Screw Co., New Bedford, Mass.* 100-page catalog on screw fasteners contains the ASA standards now in effect. All tapping-screw information is compiled in one table and every table of head dimensions lists both slotted and Philips recessed heads.

19 STAINLESS STEEL — *The Carpenter Steel Co., Reading, Pa.* 20-page bulletin describes the analysis, corrosion resistance, and working characteristics of the company's No. 20 stainless.

20 LEATHER BELTING — *American Leather Belting Assn., New York 7, N. Y.* 40-page booklet contains horsepower-rating data for flat belting, recommended minimum pulley diameters, selection tables, motor-frame mounting dimensions, and other information.

21 HYDRAULIC CYLINDERS—*Logansport Machine Co., Inc., Logansport, Ind.* 28-page catolog presents data relative to the company's recent engineering developments on their line of Rotocast hydraulic cylinders.

22 STEEL TAPES—*The L. S. Starrett Co., Athol, Mass.* 38-page catalog illustrates and describes tapes, transits and leveling instruments, accessories, and draftsmen's tools.

23 STEELS — *Republic Steel Corp., Union Drawn Steel Div., Massillon, Ohio.* 14-page pocket guide shows the furnace treatment that the company's cold-drawn steels undergo. Includes a page devoted to size data.

24 PUMPS—*The Oilgear Co., Milwaukee 4, Wis.* 8-page bulletin 10051-A illustrates and describes a line of Fluid Power pumps, motors, transmissions, cylinders, and valves.

25 PRECISION CASTINGS — *Alloy Precision Castings Co., Cleveland 14, Ohio.* 8-page brochure contains engineering data on castings produced by the Mercast process.

26 PLASTICS MOLDING — *F. J. Stokes Machine Co., Philadelphia 20, Pa.* 24-page brochure covers the fully automatic molding of thermosetting plastics. Cost savings are described, and typical applications are illustrated.

MISCELLANEOUS

27 ROLLER LEVELERS—*The McKay Machine Co., Youngstown, Ohio.* 20-page bulletin outlines the different types and sizes of roller levelers and their functions.

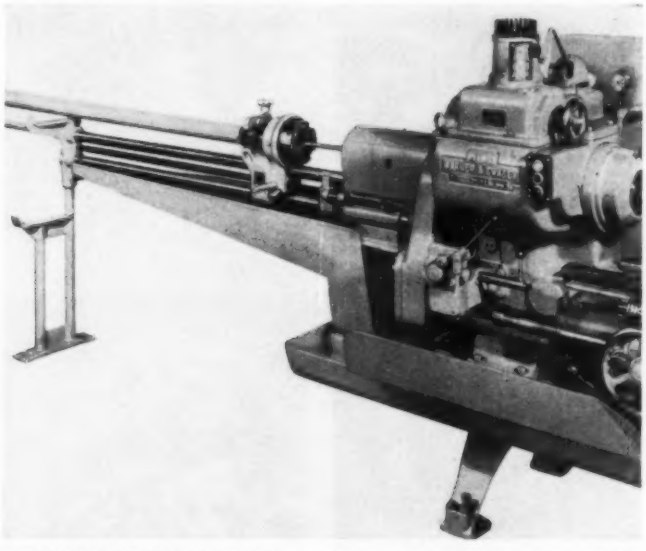
28 TIN ALLOYS — *Silverstein and Pinsof, Inc., Chicago 22, Ill.* Paper on the "Direct Colorimetric Determination of Copper and Iron in Tin and Lead-Base Alloys." Includes information on reagents and solutions, etc.

29 BOOMS AND DEPRESSIONS—*United States Steel Supply Co., Chicago 4, Ill.* The high and low points of the American economy since 1796 are graphically shown in the 1951 edition of the "Business Booms and Depressions" chart.

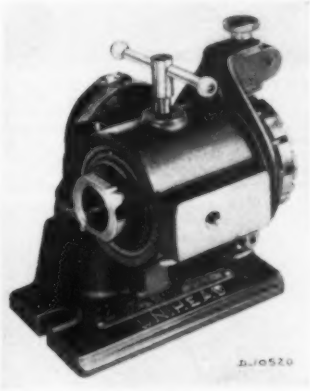
30 METALLIZING — *Metallizing Engineering Co., Inc., Long Island City 1, N. Y.* 4-page bulletin describes and illustrates several applications of a process for protecting metals against heat oxidation.

AMERICAN MACHINIST 1951 PRODUCTION PREVIEW

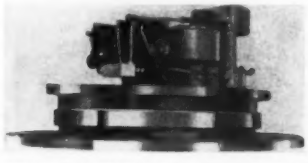
Tools and Accessories



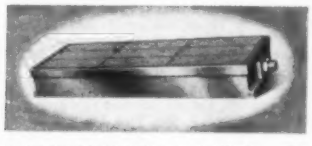
HYDRAULIC COLLET CHUCK—*The Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.* Hydraulic collet chuck and bar feed is offered as a standard accessory for the firm's No. 3, 4, and 5 turret lathes. The design involves a stand, a chuck-type bar-feed head, a control valve with a single all-purpose lever, and associated hydraulic equipment.



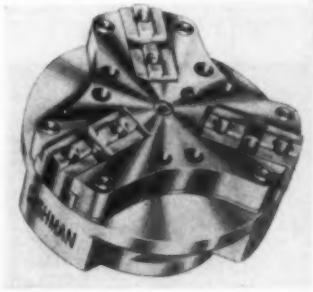
WORKHEAD—*Delta Power Tool Div., Rockwell Mfg. Co., 600 Vienna Ave., Milwaukee 1, Wis.* A universally adjustable workhead is said to provide greater flexibility in grinding keyway cutters, angular cutters, end and spiral mills, and other cutters.



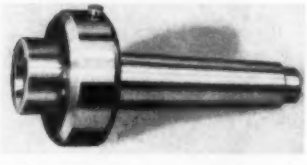
INDEX TABLES—*The Avey Drilling Machine Co., Inc., Cincinnati 1, Ohio.* The table of this automatic indexing unit rotates on hydrostatic bearings, eliminating metal-to-metal contact during indexing, and thus permitting higher table loading and less hp input.



VACUUM CHUCK—*O. S. Walker Co., Inc., Worcester, Mass.* Brass, copper, aluminum, and other non-ferrous materials can be held in this vacuum chuck. Designed to operate at a 23-in. vacuum, at which it exerts a total force of 1400 lb on a 1x2-ft piece of material.



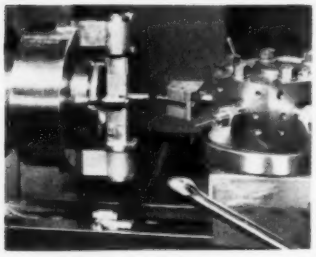
CHUCK—*The Cushman Chuck Co., Hartford, Conn.* The jaws of this aluminum-body chuck are aligned on hardened-steel bearing surfaces for application to machines operating at high speeds.



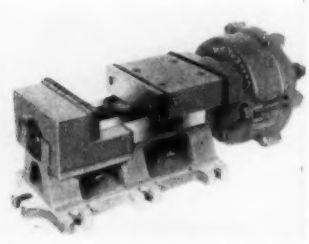
LIVE CENTERS—*South Bend Lathe Works, South Bend 22, Ind.* Female live centers, designed for supporting centerless shafts, are available in two sizes, No. 3 Morse-taper shank with maximum capacity of 1 in. and No. 2 Morse-taper shank with ¾-in. capacity.

DRILL VISE—*Universal Vise & Tool Co., Parma, Mich.* The column attachment of this vise insures against accidents resulting from the vise or work turning during drilling. It enables the entire unit to be swung out of the way when not needed.

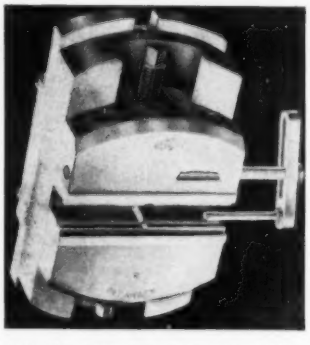
MACHINE VISE — *Ames Precision Machine Works, Waltham 54, Mass.* The Ames vise for milling machines, drillpresses, and shapers has 8-in. wide jaws that open a full 11 in. To operate, wrench is placed in position shown, turned left two complete revolutions to release sliding block.



INDEXING CHUCK — *Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.* Indexing chuck built for Warner & Swasey Electro-Cycle machine is actuated by a floor air valve. The chuck jaws index on an axis parallel with the chuck face through each of four 90° positions while the spindle is turning.



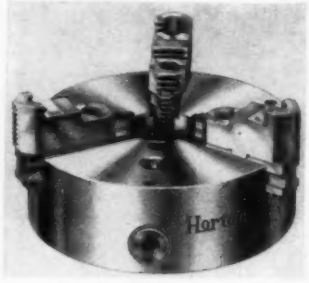
MACHINE VISE—*Van Products Co., Erie, Pa.* There is no hand-tightening when using the Vi-Speed Machine Vise. Air does the work by means of a large, single-acting cylinder.



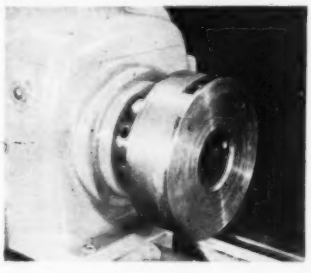
CHUCK—*Cosa Corp., Chrysler Bldg., 405 Lexington Ave., New York 17, N. Y.* The unit clamps concentric, is eccentrically adjustable, and is for use on lathes, indexing heads, and circular tables of milling machines and similar machine tools.

HOLLOW CENTER — *Cosa Corporation, Room 624, Chrysler Bldg., 405 Lexington Ave., New York 17, N. Y.* Incorporates both a center and an exchangeable center disk with 16 centers distributed over its circumference. Each of 8 different sizes of centers is directly opposite one of equal size on the ring.

WORKHOLDER — *Sundstrand Machine Tool Co., Rockford, Ill.* The Power-grip magnetic chuck is for keyway milling, die-block milling, form grinding, and diversified toolroom work. Has Viking chucks mounted on an adjustable fixture.



CHUCK—*E. Horton & Son Co., Windsor Lock, Conn.* Jaw ways of the S line of lathe chucks are said to have been flame hardened without affecting the accuracy of the chuck body.



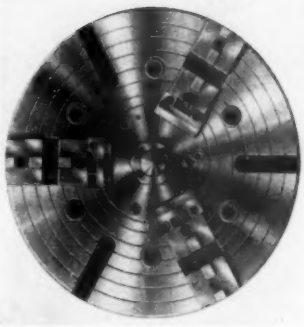
WORK DRIVER—*The Monarch Machine Tool Co., Sidney, Ohio.* Work driver for Monarch lathe is equipped with serrated jaws and is recommended for in-between-center operations of all types where marking of the driving surface is permissible.

HYDRAULIC VISE — *The Columbian Vise & Mfg. Co., 9021 Bessemer Ave., Cleveland 4, Ohio.* Vise with two-pedal foot control leaves both hands free for every operation, the vise being closed, locked, and released by the operator's foot.

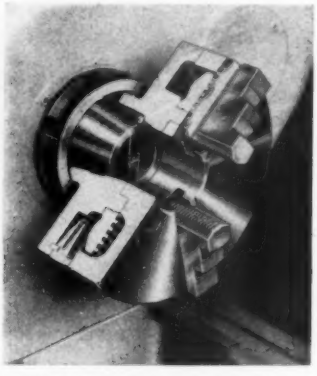
WORK ALIGNER—*Johnson Machine Works, 619 Menomonie St., Eau Claire, Wis.* This rotary aligner can handle either centered or uncentered work and checks alignment or runout on any circular material from ¼- to 24-in. dia.

CLAMPS — *Kellner Tool & Machine Co., 18490 Mt. Elliott Detroit 34, Mich.* Consisting of two parts of heat-treated steel, simple precision clamps need no parallels or clamping blocks. Said to eliminate binding and buckling, and to release strains on clamping slots.

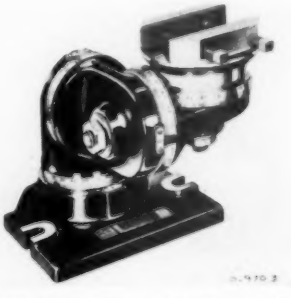
VISE—*Chicago Tool & Engineering Co., 8383 S. Chicago Ave., Chicago 17, Ill.* This vise can be rotated 360° horizontally and quickly locked in any position. The swivel bench base is bolted to a workbench for shop work, but the vise may be easily removed for use on machines.



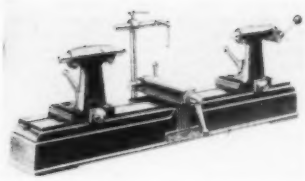
POWER CHUCK — *The Cushman Chuck Co., Hartford, Conn.* With this three-jaw compensating power chuck it is not necessary to use fulcrum-type top jaws or other special workholding devices for a large range of irregular-shaped work.



CHUCK—*Union Mfg. Co., Church St., New Britain, Conn.* A universal chuck has the scroll hub integral with the chuck back and machined on exactly the same type spindle on which the chuck will be used, and is, therefore said to be inherently concentric with the spindle.

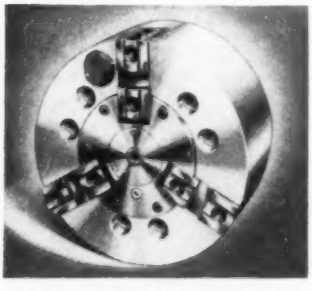


VISE—*Delta Power Tool Div., Rockwell Mfg. Co., Milwaukee 1, Wis.* Made up of four separate parts, each of which can be rotated, it provides four separate, distinct planes of adjustment.

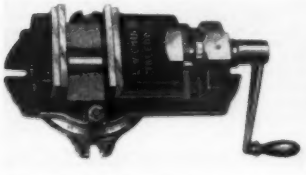


BENCH CENTER—*Delta Power Tool Division, Rockwell Mfg. Co., Milwaukee 1, Wis.* Furnished with a universal indicator support bracket, it is said to be a completely self-contained unit.

MILLING-VISE ATTACHMENT—*J. & S. Tool Co. Inc., 477 Main St., East Orange, N. J.* Down-hold vise jaws and attachable parallels are said to eliminate the necessity of hammering work down or cleaning of chips between operations.



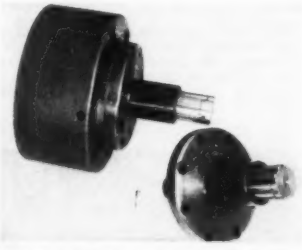
ALUMINUM CHUCK — *The Whiton Machine Co., New London, Conn.* Whiton power-operated chucks are constructed of Whitaloy, a special-analysis heat-treated aluminum alloy.



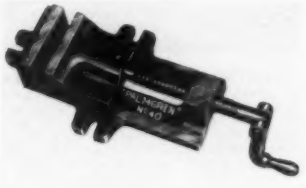
SWIVEL-BASE VISES—*L. W. Chuck Co., Toledo, Ohio.* These swivel-base milling-machine vises are built of semi-steel castings in three sizes, 3 in., 4½ in., and 6½ in. They employ hardened-steel sliding jaws.

C-CLAMP—*Wilton Tool Mfg. Co., 925-941 Wrightwood Ave., Chicago 14, Ill.* Standard-duty carriage clamps and heavy-duty machinist clamps have precision-cut spindles with modified Acme threads.

VISE JAWS — *Johnson Machine Works, 617-619 Menomonie St., Eau Claire, Wis.* They fit standard 3- to 6-in. vises. They are made with a spring-steel back and a fiber face that will not mark finished surfaces.

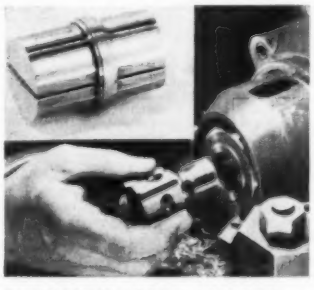


SPLINE CHUCKS—*MP Tool and Engineering Co., 2339 Caniff Ave., Detroit 12, Mich.* Adjustable self-centering spline adapters for parts with different tooth specification can be changed in MP adjustable spline chucks in a few minutes.

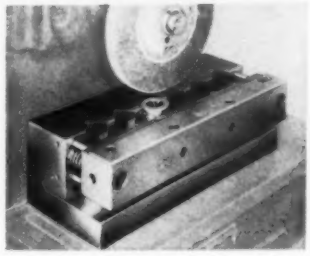


DRILLPRESS VISE—*Chicago Tool & Engineering Co., 8383 South Chicago Ave., Chicago 17, Ill.* The movable jaw on this No. 40 vise is grooved vertically for holding round work.

MAGNETIC CHUCK — *Continental Electric Co., Hawthorn, Calif.* Electric magnetic chuck, designed for use on lathes, features great holding power. Work is held by magnetic forces with a total pull of over 2 tons.

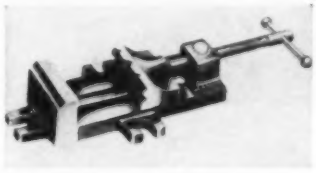


EXPANDING-ARBOR HOLDER — *The Asco Corp., 17718 Waterloo Road, Cleveland 19, Ohio.* Auto-Arb is designed for holding work by the inside diameter while machining the outside. It permits chunking and unchucking the work without stopping the spindle.



GANG VISES—*Dery Tool & Die Co., Pine Meadow, Conn.* Two gang vises for precision grinding of small parts have equalizing blades which automatically compensate for differences in work tolerances.

POSITIONER—*Aronson Machine Co., Arcade, N.Y.* The Model 14C500 universal balanced positioner has been altered to allow a maximum capacity of 1000 lb. Worktable and workarm now have brake bands for friction.

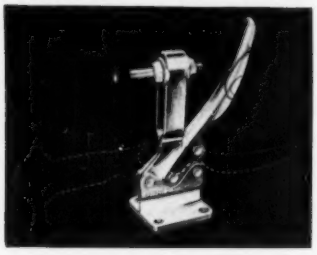


VISES — *Lockrey-Fater Corp., 401 Broadway, New York 13, N.Y.* A semi-automatic clutch has been applied to machinists' vises and C-clamps, and is said to permit practically instantaneous closing and opening of the clamp or vise.

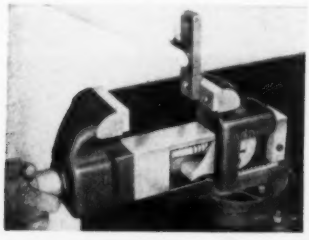
ANGLE PLATES—*The Portage Mach. Co., Akron, O.* Angle plates made in two sizes, one six slots and the other four slots high. They are of close-grain cast iron rough machined, normalized for stress relief to prevent warping, and then finish-machined on all faces and edges.

VISE—*Kenco Mfg. Co., 5211 Telegraph Rd., Los Angeles, 22, Calif.* The beveled edge of the base of this vise reads from 90 to 0° in two directions allowing synchronized readings for markers on either side of the vise.

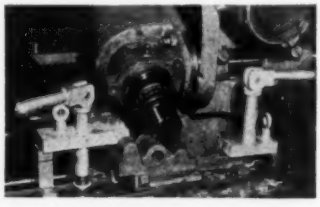
GRINDER DOG—*Ready Tool Co., 550 Iranistan Ave., Bridgeport, Conn.* The Red E reversible dog comes in five sizes to accommodate all capacities from ¼ to 6 in. and fits all makes of cylindrical-grinding machines.



TOGGLE CLAMP—*Detroit Stamping Co., 343 Midland Ave., Detroit 3, Mich.* Known as the De-Sta-Co No. 235-U, the clamp features holding pressures up to 650 lb with fast toggle action.



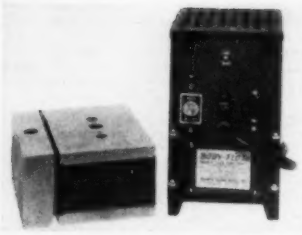
MACHINIST'S VISE — *Dodge Mfg. Corp., Mishawaka, Ind.* This vise opens or closes to any position in one second through a push-pull action which eliminates spinning the handle.



CLAMP — *The Naper Clamp Co., Naperville, Ill.* Set up by bringing the clamping bar to rest on the work and locking it. A series of teeth on a cam is turned to mesh with the serrations on the locking post.

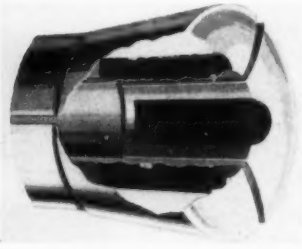
INDEXING FIXTURE — *Barnes Equipment Co., 109 Brookside Ave., Jamaica Plain, Boston, Mass.* This fixture features a control lever which easily and rapidly closes the collet.

CHUCK JAWS—*Diamonds and Tools, Inc., 19345 John R Street, Detroit 3, Mich.* A hard-facing alloy known as Colmonoy is being used in making cast inserts for chuck jaws. It is claimed that they have a longer life with greater accuracy than tool-steel jaws.



MAGNETIC CHUCK—*Magnetic Holding Devices, Inc., 2034 E. 22nd St., Cleveland 15, Ohio.* A 6-in. unbroken line of magnetism, said to permit grinding uniformly parallel sides, is provided by the Body Flo Jr.

INDEXING FIXTURE—*Snow Manufacturing Co., 435 Eastern Ave., Bellwood, Ill.* The basic versatility of the No. 14 horizontal-indexing unit provides for a wide range of tooling applications for drilling, reaming, countersinking, and tapping operations.

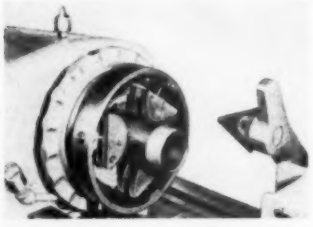


COLLETS—*S & E Machine Products, Bridgeport, Mich.* Collets and feed fingers worn oversize can be reclaimed and the precision restored by inserting carbide wear sections ground to collet dimensions.

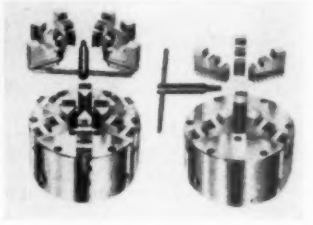
VISE—*The Hartford Precision Machine Co., 108 Van Block, Hartford,* Conn. Vertical vise, machined and scraped to close tolerances, is said to allow more rapid and accurate location of parts being machined by giving three dimensional location of work.

AIR VISES—*Van Products Co., Erie, Pa.* Vi-Speed air-operated vises are available with interchangeable jaw faces. They are hardened tool steel with either serrated or smooth surfaces.

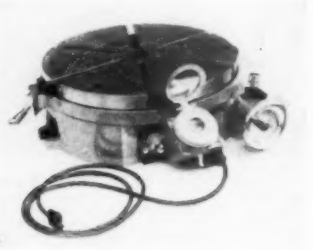
DRILLPRESS WORKHOLDER — *Torkarm Corp., 2908 Emerson Ave., So., Minneapolis, Minn.* Operating on the same principle as a pantograph drafting machine, the Torkarm attachment holds work securely while permitting the operator to move it freely across the worktable.



CHUCK—*Peerless Machine Co., 1600 Junction Ave., Racine, Wis.* Speed with which work may be chucked or repositioned on the Roto-Loc is said to be substantially higher then that obtainable with conventional scroll chucks.

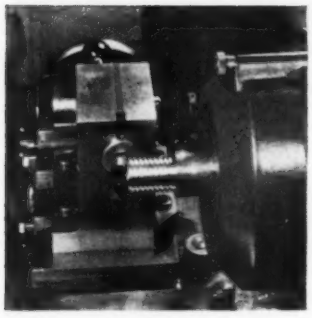


CHUCK—*Buck Tool Co., 2015 Schippers Lane, Kalamazoo 62, Mich.* This self-centering chuck is said to provide the flexibility and speed of scroll chucks, plus precision of four-jaw independent chucks.

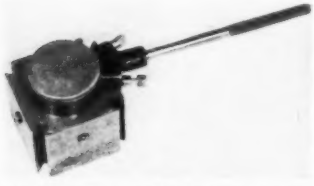


INDEX TABLE—*The F. T. Griswold Mfg. Co., 305 W. Lancaster Ave., Wayne, Pa.* OPL 16-in.-dia rotary index table is designed to provide extra capacity and rigidity necessary to machine the heavier run of jobs. For larger-size milling machines, jig borers, and grinders.

COLLET ATTACHMENT — *Bell Equipment Co., 5212 Santa Fe Ave., Los Angeles 58, Calif.* Waltco quick-opening and -closing collet attachment has a cam spool and fingers said to give a vise-like holding power with minimum pressure on the actuating lever.



RETRACTABLE TOOLHOLDER — *The Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.* Threading toolholder, for use on the cross-slide of Warner & Swasey turret lathes, automatically withdraws the tool from the work at any desired point. This permits cuts close to shoulders.

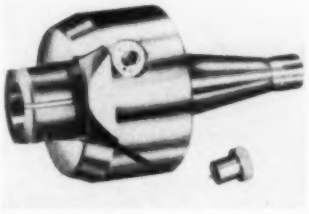


TOOLPOST, TOOLHOLDER COMBINED — *Marnat Machine Works, 565 7th St., San Francisco 3, Calif.* Said to be rigid, accurate, automatic, and simple to operate, this combination can be set at any angle by means of the upper locking pin on the base of the handle.

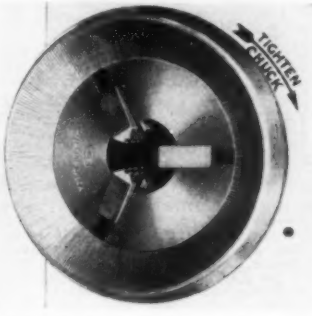
LATHE TOOLHOLDER—*W. H. Sackman Co. Inc., 44 N. 4th St., Philadelphia 6, Pa.* Two sizes of this adjustable toolholder are in production for use on 9- and 16-in. lathes. It is said to hold wide tools on comparatively narrow bases with absence of chatter.

BIT HOLDER—*Keller Tool Co., Grand Haven, Mich.* Alnico permanent-magnet bit holder, set in a nickel-steel case, serves the dual function of keeping bits in place by magnetic attraction and holding screws in position for driving.

PARALLEL HOLDERS — *Tinker's Thread Grinder Co., 136 Granby Road, S. Hadley Falls, Mass.* For holding tools, dies, and fixtures these adjustable parallels are offered in the following sizes—Height 4 in., length 10 in., and width adjustable from 3¼ to 11¼ in.; height 6 in., length 12 in. and width adjustable from 3¾ to 13½ in.; and height 6 in., length 18 in., and width adjustable from 4 to 20 in.

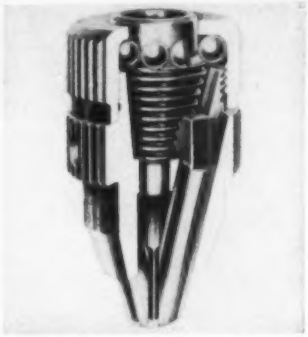


BORING HEAD — *Everede Tool Co., 2000 N. Parkside Ave., Chicago 39, Ill.* Boring head supplements the other sizes being manufactured by Everede tool. It is 3½ in. in diameter and has a maximum boring capacity of 4½ in.

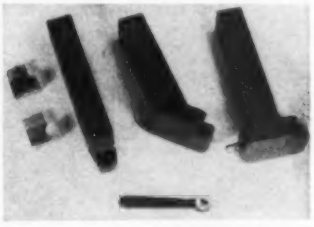


CHUCK—*Oster Mfg. Co., Cleveland, Ohio.* Known as the Auto-Grip chuck, the jaws grip pipe automatically. For all 2-in. pipe-threading machines which revolve the work.

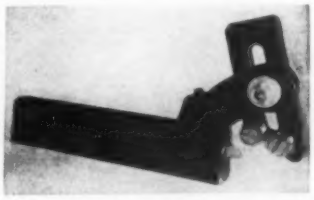
TOOLHOLDER—*Scully-Jones and Co., 1902 South Rockwell St., Chicago 8, Ill.* A double gear or spline drive coupling in the JA floating holder gives unrestricted parallel and angular float for accurate stopping, reaming, and similar operations.



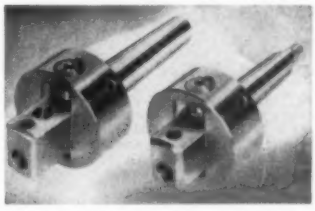
KEYLESS DRILL CHUCK—*Etco Tool Co. Inc., 549 Johnson Ave., Brooklyn 6, N. Y.* Chuck is merely inserted and hand tightened. Machining action centers the tool and tightens the grip, preventing slippage.



TOOLHOLDERS—*The Apex Tool & Cutter Co. Inc., Shelton, Conn.* Different shapes of toolbits and various grades of carbides can be interchanged in these toolholders. Mating serrations permit toolbits to be adjusted for wear.



TOOLHOLDER — *Dasso Tool Products, Box 13, Lincoln Park, Mich.* Combination toolholder and followrest virtually eliminates the necessity of using steady rests or bulky machine followers in turning long small-dia work on lathes.



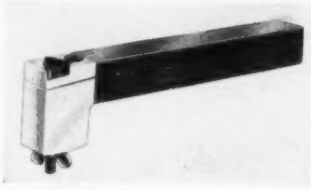
BORING HEADS—*Flynn Mfg. Co., 443 Bates St., Detroit 26, Mich.* Lightweight heads measure 2⅞ in. in diameter, have a bar capacity of ½ in. and will offset to a maximum of ½ in.

MILLING-MACHINE CHUCK — *Eric S. Johnson Co., 230 East Ohio St., Chicago 11, Ill.* The bayonet locking nut in the Johansson chuck is claimed to make mill shanks run true because the chuck nut is given a much closer fit in the chuck body than would be expected with most threaded parts.

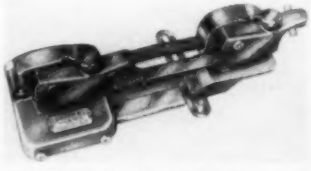
TOOLHOLDER—*Scully-Jones & Co., 1901 So. Rockwell St., Chicago 8, Ill.* JA floating holder has been lifted from the power transmission field. Misalignment between two shafts can be compensated for by a double-gear or spline-drive coupling.

AUTOMATIC BAR FEED—*O. K. Specialty Co. Inc., 910 West Lake St., Chicago 7, Ill.* Constructed to handle 12-ft stock bars of all shapes and sizes and will feed any required length to the stop.

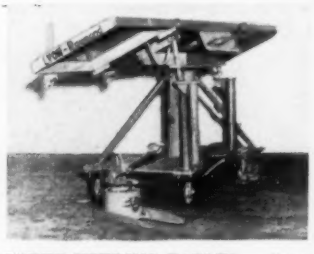
VIBRATOR FEEDER—*F. J. Stokes Machine Co., 5900 Tabor Road, Philadelphia 20, Pa.* With controller for press feeding. Has been added to the standard equipment of the Stokes Model 741 automatic molding press.



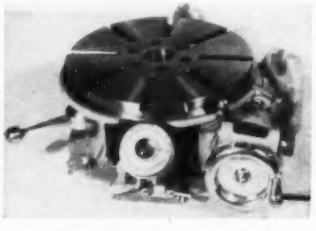
TOOLHOLDERS — *Super Tool Co., 21650 Hoover Road, Detroit 13, Mich.* Chrome plating is claimed to increase the life of the injector toolholder for solid-carbide insert, up to 500% by eliminating chip erosion.



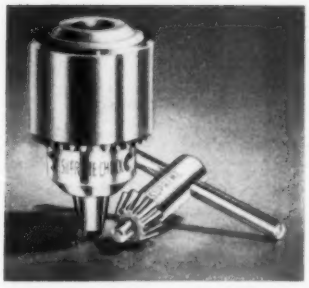
HITCH FEED—*H. E. Dickerman Mfg. Co., Springfield, Mass.* This 2½-in. hitch feed is claimed to be the first feed for handling the lighter gages of stock from 0.003 in. to 0.050 in.



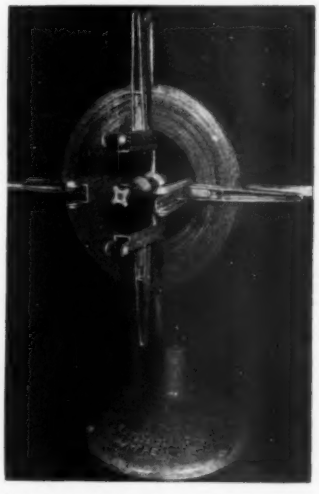
SHEET FEEDING TABLES — *Lyon Raymond Corp., 4773 Madison St., Greene, N. Y.* Tables with self-tilting tops are for use with inclined-bed presses. The top is hydraulically tilted to the desired angle by manipulation of pump and table supports.



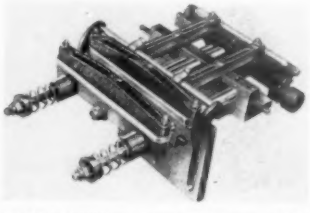
INDEXING TABLE—*F. T. Griswold Mfg. Co., 305 W. Lancaster Ave., Wayne, Pa.* All settings of the OPL indexing table are made with the aid of a system of lenses, working in conjunction with a master reference drum carrying 360 finely engraved lines equally spaced about its periphery.



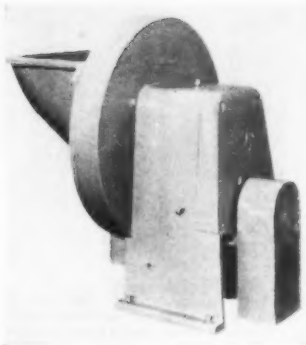
KEY CHUCK—*Supreme Products Inc., Chicago, Ill.* The manufacturer of this key chuck claims that slippage between the outer shell and threaded nut is eliminated by one-piece construction.



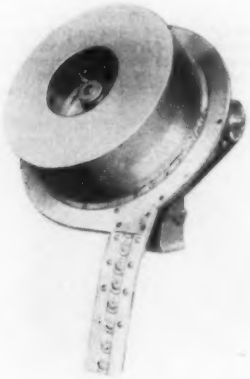
STOCK REEL—*U. S. Tool Co. Inc., Ampere (East Orange), N. J.* Collapsible holding forks on the SRF-654 eliminate the necessity for removing forks while loading. Stock up to 6-in. width can be handled.



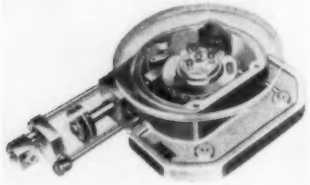
STOCK FEED—*Great Western Tools Inc., 3811 Riverside Drive, Burbank, Calif.* Applicable to punch presses, spotwelders, drillpresses, and similar machines, the pneumatic Feedmaster handles coiled or strip stock of almost any size and shape up to 18-in. width and 12-in. stroke.



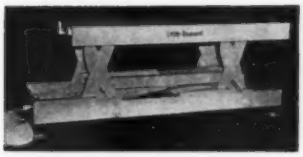
ROTARY HOPPERS—*Kraus Design, Inc., 950 Exchange St., Rochester 8, N. Y.* Four standard sizes of rotary cast-aluminum hoppers have been added to original line of tumble hoppers. Sizes are 8 in., 12 in., 16 in., and 24 in. in diameter.



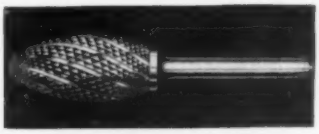
HOPPER FEED—*Feedall Machine and Engineering Co., 29 Elm Street, Willoughby, Ohio.* Model H-100 automatic hopper feed is self-contained and incorporates a selector ring, driven by a fractional-hp motor. The ring rotates through the work both selecting and feeding it from the under side in one operation.



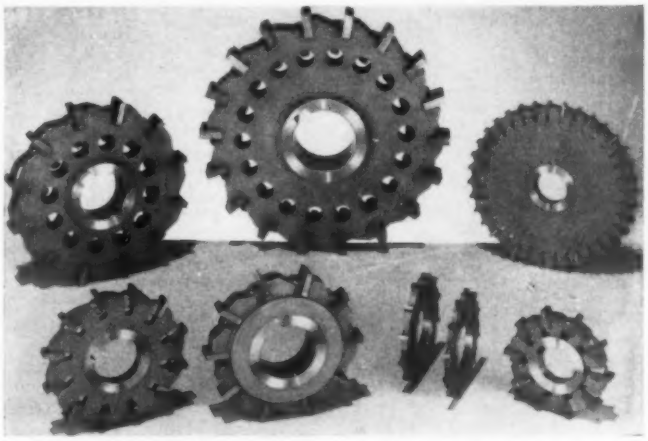
FEED TABLE—*The A. K. Allen Co., 495 Wythe Ave., Brooklyn 11, N. Y.* Standard dial feed tables, Models 11EA and 11EB, can be set to index every 90, 60, 45, 30, or 15°. Baffles are used to prevent the pawl from engaging improper teeth when less than 24 indexes are required.



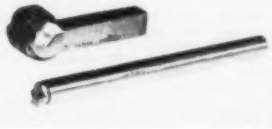
SHEET-FEEDING TABLES — *Lyon-Raymond Corp., 4267 Madison St., Greene, N.Y.* A compound-lever arrangement in the No. 1196 sheet-feeding table is said to provide exceptionally low height and a greater range of elevation.



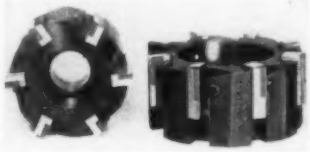
CARBIDE BURS—*Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford 1, Conn.* To provide the operator with better control, especially in nose cutting on tough steels, flutes have been deepened at special intervals on the Di-Burs diamond-cut carbide burs.



MILLING CUTTERS—*Lovejoy Tool Company, Inc., Springfield, Vt.* Carbide blanks of standard shapes, held in slots in the cutter body by tapered circular-peg wedges, characterize the Type S cutter. This design permits a greater number of blades per cutter and a larger arbor hole for a given cutter diameter, as well as adjustment for minimum carbide grinding.



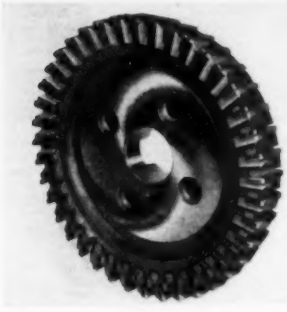
CIRCULAR CUTTERS—*J. S. Tool Co., 477 Main St., East Orange, N. J.* Koala tools can be placed without removing the shank from the machine. Can be reground without a jig, and any desired rake can be used.



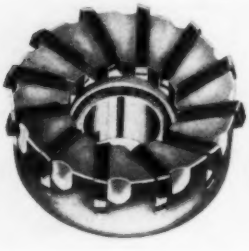
END MILLS—*Super Tool Co., 21650 Hoover Road, Detroit 13, Mich.* Carbide-tipped replaceable serrated-back blades of these shell end mills are said to be firmly held, easily adjusted, and able to withstand high table feeds and provide long production life.

ROTARY TOOL—*M. A. Ford Mfg. Co., Inc., Davenport, Ia.* This rotary tool with an off-center flute can be used for countersinking, chamfering and burring, valve-seat finishing, and center reaming.

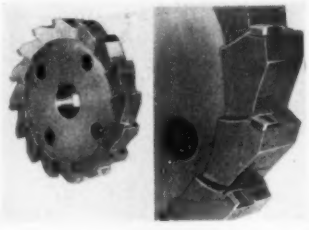
DIE-SINKING CUTTERS — *Reltool Corp., Milwaukee 3, Wis.* Spiral flutes and clearances of these cutters are designed to provide maximum cutting efficiency without vibration, and to leave a smooth, clean finish.



MILLING CUTTERS — *Goddard & Goddard Company, P. O. Box 68, Brightmoor Station, Detroit 23, Michigan.* The Serra Tip line of cutters use solid-carbide inserts and permit extremely fine tooth spacing, allowing inserted-blade construction in cutters as small as 1-in dia.



MILLING CUTTER—*Super Tool Co., 21650 Hoover Road, Detroit 13, Mich.* Solid-carbide blades in this milling cutter are locked by means of setscrews which move locking wedges in for locking and out for blade removal. This method is said to permit a greater number of blades in a given size of cutter.

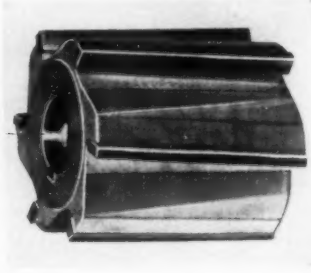


FACE MILL—*Nelco Tool Co., Inc., Manchester, Conn.* Carbide-tipped face mill incorporates new angles that are a modification of the Nelco Tri-Helix grind. The tool has nickel shims, sandwich brazing, and alloy-steel bodies.

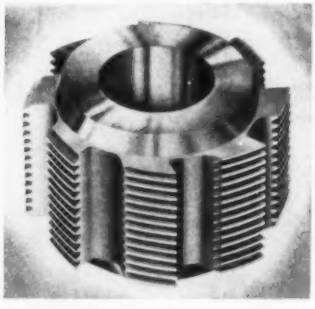
FACE MILL—*Nelco Tool Co., Inc., Manchester, Conn.* Fine-tooth face mill is designed especially for milling cast-iron rims and bosses. Doubling the number of teeth normally used is said to allow for extra tooth engagement and make a smoother-running cutter.

HOLLOW-MILL LINE—*Reltool Corp., 4540 W. Burnham St., Milwaukee 14, Wis.* Hollow mills are available with two forms of teeth; undercut teeth for milling steel, and straight teeth for milling brass and other non-ferrous metals.

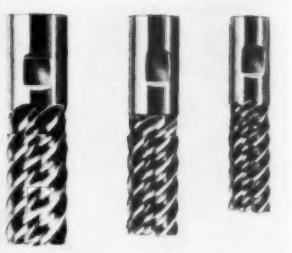
END MILL—*Putnam Tool Co., 2981 Charlevoix Ave., Detroit 7, Mich.* Available in stock sizes from 1½ in. up, Positiv-Lok end mill is said to reduce milling-tool costs as much as 25%.



SLAB MILLS—*The Nelco Tool Co., Inc., Manchester, Connecticut.* Carbide-tipped slab mills are available in Series 300 for use on cast iron, brass, and bronze, and Series 400 for aluminum, magnesium, and similar metals. All tools are of spiral-tooth design.

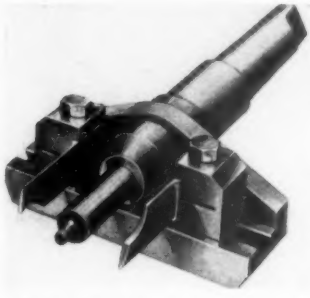


FINE-PITCH HOBS — *Illinois Tool Works, 2501 N. Keeler Ave., Chicago 39, Ill.* These hobs are used to cut 20-diametrical-pitch gears and finer. A toolgraph chart which accompanies each hob shipped, shows the variation in the lead of each hob.

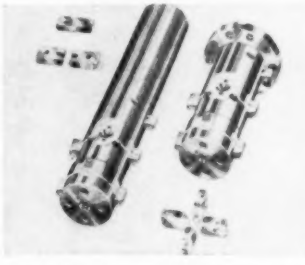


END MILL—*Shearcut Tool Co., P.O. Box 746, Reseda, Calif.* The helical cutting edges of these end mills have an extremely large angle compared to the axis of rotation, causing a shearcutting action.

COUNTERBORE — *Wendt-Sonis Co., Hannibal, Mo.* Carbide-tipped tools are claimed to eliminate chatter and provide an extra-smooth finish.



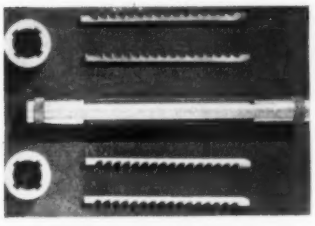
FLYCUTTER—*Karl A. Neise, 381 Fourth Ave., New York 16, N. Y.* This boring tool is claimed to be capable of boring a 5-in. hole in 1-in. boiler plate in 80 sec.



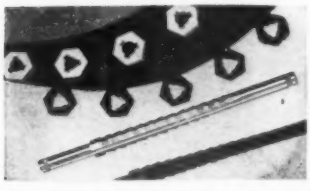
CAR-WHEEL BORING TOOLS — *Davis Boring Tool Div., Giddings and Lewis Machine Tool Co., Fond du Lac, Wis.* Increased car-wheel boring output is reported with this four-cutter boring wheel. Tools are provided with cemented-carbide cutters.

STUB BORING TOOLS—*Davis Boring Tool Div., Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.* Assembled primarily for the company's horizontal boring, drilling and milling machines, Davis sets contain seven tools which cover a boring range from 1¼- to 7-in. dia.

KEYWAY BROACH — *The du Mont Corp., Greenfield, Mass.* Staggered teeth on the "Minute Man" keyway broaches for cutting ⅞- and 1-in. keyways provide ample chip room for heavy cuts in long bores.

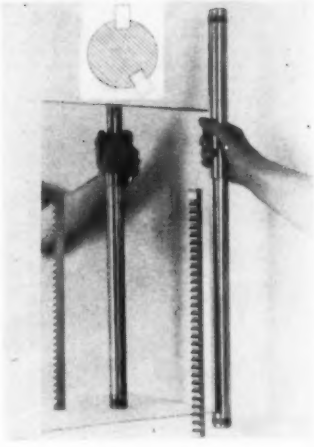


PUSH BROACH—*Kase Machine Co., 18422 Buffalo Ave., Cleveland 19, Ohio.* Designated LK-4, this push broach will cut 1, 2, 3, or 4 precision keyways in a single pass. Milled slots containing cutting blades are located at 90° intervals.

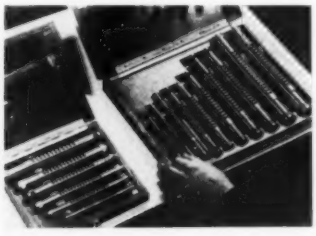


PUSH BROACH—*The Kase Machine Co., 18422 Buffalo Ave., Cleveland 19, Ohio.* Three-keyway broaches can cut one, two, or three keyways in a single pass to meet individual job requirements. It has interchangeable blades which are adjustable for depth of cut.

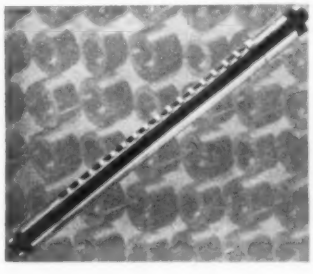
BROACHES—*Colonial Broach Co., Box 37, Harper Station, Detroit 13, Mich.* Have a higher finish on the cutting rake due to a process called Dymon-Ize sharpening. It is said to reduce the height of the minute tool marks at the cutting edges.



TWO-PASS BROACH—*The Kase Machine Co., 18422 Buffalo Ave., Cleveland 19, Ohio.* Broach incorporates two slots in the body and only one cutting blade. The blade is cut on a taper to assure positive cutting action by each tooth.

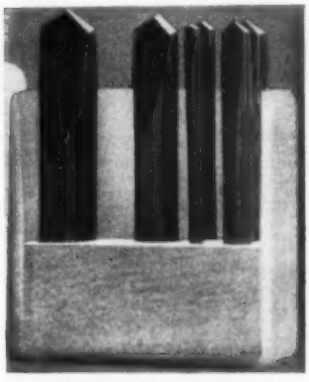


BROACH SETS—*The Kase Machine Co., 18422 Buffalo Ave., Cleveland 19, Ohio.* Toolroom set No. 10 contains ⅜-, ½-, ⅝-, ¾-, ⅞-, and 1-in.-dia Glenny push broaches. Set No. 15 contains broaches of ⅜-, ½-, ⅝-, ¾-, ⅞-, 1¼-, 1⅜-, and 1½-in.-dia. All have protected-blade design, chatter elimination and other features.

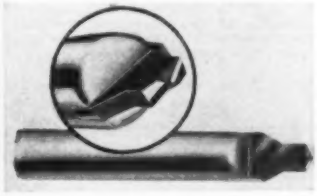


PUSH BROACH—*Kase Machine Co., 18422 Buffalo Ave., Cleveland 19, Ohio.* Has a cutting blade with 12° rake on the teeth. Teeth are sharpened on front face only, and can be resharpened repeatedly without loss in cutting tolerance.

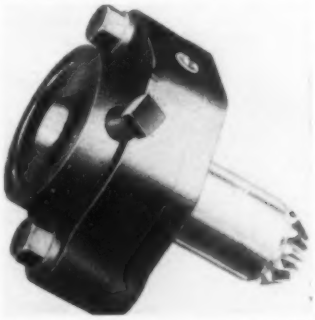
BROACH—*Acme Broach Corp., Milan, Mich.* The "Whole Hog" broach-design principle is applicable to either internal or surface broaches and is primarily for use where stock removal is heavy. Increases in tool life up to 88% are said to have been obtained over other special designs.



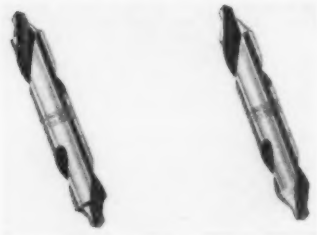
CARBIDE DRILLS — *Firth Sterling Steel & Carbide Corp., McKeesport, Pa.* Firthite drills are designed for drilling of metals up to 66 Rockwell C. They are ground from solid Firthite (sintered carbide) cylinders, and are pointed and relieved for free cutting.



CENTERDRILL—*National Tool Salvage Co., 6511 Epworth Blvd., Detroit 10, Mich.* This tool was developed to drill new centers on tools that had been ground off or on which centers were so worn as to be useless. It combines drilling and countersinking in one operation.



DRILLING TOOL — *Boyar-Schultz Corp., 2110 Walnut Street, Chicago 12, Ill.* Deep-hole drilling tool provides an oscillating action in the head of the holder. This action breaks chips into small particles, which are ejected along the flutes of the drill.



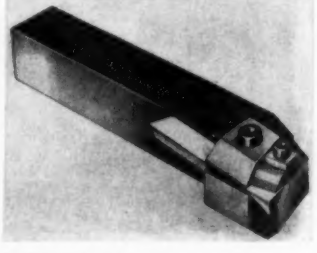
DOUBLE-END TOOL—*Cogsdill Twist Drill Co., Detroit, Mich.* Greater shear-cutting action of the Chip-Flow double-end combination drill and countersink allows the drill to take chips with greater efficiency and less effort.

DRILLS, TAPS—*Mohawk Tool Co., 21647 Dequindre Road, Hazel Park, Mich.* The Subland combination drill-tap has drilling flutes, smaller in diameter than the tap, but greater than the root diameter. They are circle ground their entire length.

DRILL—*Black Drill Co., 1400 E. 222nd St., Cleveland, Ohio.* A change in the formulation of the alloy material itself is said to improve the torsional strength of the Hardsteel drill, increase toughness, and retain original wear-resisting properties.

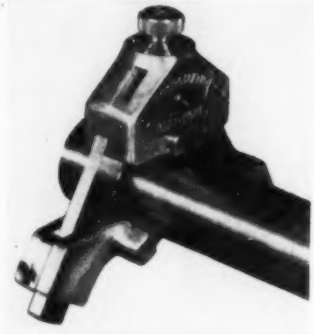
DEBURRING TOOLS — *Nobur Mfg. Co., Burbank, Calif.* DS series tools have a smaller pilot size for deburring holes as small as ⅛ in. Other sizes are 5/32, 3/16, and 0.189. in.

ROTARY FILES—*The Charles L. Jarvis Co., Middletown, Conn.* Ground from the solid carbide end mills, files, and reamers are said to outlast ordinary high-speed steel more than fifty times without regrinding.



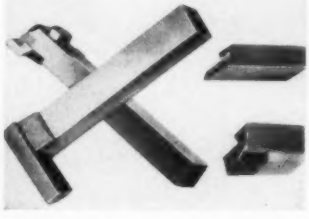
TURNING TOOL—*Everede Tool Co., 2000 N. Parkside Ave., Chicago 39, Ill.* Equipped with mechanical chip breakers, adjustable to on-the-job conditions. Only the toolbit is ground when sharpening.

CARBIDE DRILL—*Cleco Div., Reed Roller Bit Co., P. O. Box 2119, Houston, Texas.* For use in the Handi-Drill, it will penetrate at the rate of 5 ipm, and has been known to drill 500 holes without resharpening.

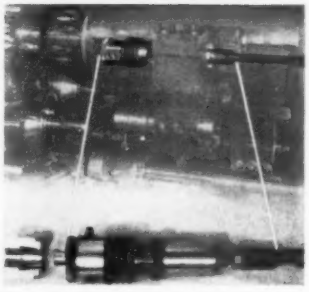


HONING TOOL — *The Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 4, Mich.* Claimed to produce accurate, highly finished, surfaces on cylindrical parts ranging from ½- to 2½-in. dia. It may be used with any lathe, drillpress, or electric drill.

REAMER — *Woodruff & Stokes, Quincy 69, Mass.* Suitable for either hand or machine use, Tru-Reem tapered reamers will remove burrs, improve fits, enlarge or clean holes from 1/64- to 1/16-in. diameter.



LATHE TOOLS—*Bokum Tool Co., Detroit, Mich.* Carbide cutting blades in these lathe tools are locked in the holders at the proper cutting and clearance angle, obviating the necessity of reworking the angles while the cutting blade is being resharpened.



INTERNAL FORMING TOOL — *The Maxwell Co., 590 Broadway, Bedford, Ohio.* Series DB tools facilitate production operations on screw machines formerly requiring secondary setup. Can be used in any position and can be interchanged between different machines.

LAPPING TOOL — *Ideal Industries, Inc., Park Ave., Sycamore, Ill.* The Xpand-O-Lap is a self-aligning self-adjusting lapping tool which provides constant pressure between lap sleeves and work.

HONING TOOLS — *New Products Dept. 1, Sunnen Products Co., 7910 Manchester, St. Louis 17, Mo.* Honing-tool line covering a dia range of ⅛ to 2¾ in. can be used with all metals, all hardnesses. For sizing and finishing external diameters.

TOOL BRAZING—*Rutland Tool Service, 13006 Greeley Ave., Detroit 3, Mich.* By butt brazing the unused ends of flat and dovetail form tools, worthless ends are brazed together to meet new-tool specifications.

TUNGSTEN-CARBIDE—*S & E Machine Products, Inc., Bridgeport, Mich.* Collets and feed fingers, normally worn over size, can be reclaimed and the precision of the parts restored by inserting carbide wear sections ground to collet dimensions. It is only necessary to send collets for rework giving the hole size required.

BANDSAW STOCK—*The L. S. Starrett Co., Athol, Massachusetts.* Safety reel dispensers hold a 100-ft. coil of bandsaw stock, secured by a revolving arm.

TUNGSTEN-CARBIDE BALLS — *Industrial Tectonics, Inc., Ann Arbor, Mich.* The extreme hardness, high surface finish, and compressive strength of tungsten-carbide balls when used for burnishing are claimed to result in excellent finish, good size control and uniformity of the finished part.

POWER-HACKSAW BLADE—*W. O. Barnes Co., Inc., Detroit, Mich.* The Red Rocket is a power-hacksaw blade, said to be capable of withstanding heavy feeding pressures because of its flexibility and toughness.

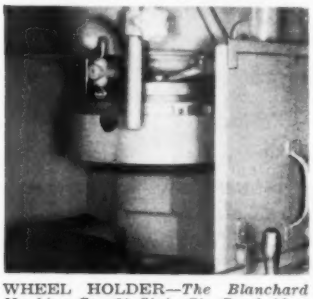
CUTOFF WHEELS—*Chicago Wheel & Mfg. Co., 1101 W. Monroe St., Chicago, Ill.* Cut-off wheels are being packaged in glassine, heat-sealed envelopes to avoid damaging moisture absorption.

DIAMOND WHEEL—*The Wickman Manufacturing Co., 15533 Woodrow Wilson Ave., Detroit 3, Michigan.* A special steel bond is reported to give this wheel extra long life, eliminate wheel dressing, and to permit three to four times faster grinding.

INTERNAL GRINDING WHEELS—*The Carborundum Co., Niagara Falls, N. Y.* V1 bond wheels are reported to cut faster, cooler, and freer. A greater range of work is said to be obtained from one grade while surface finishes are improved and closer tolerances held.

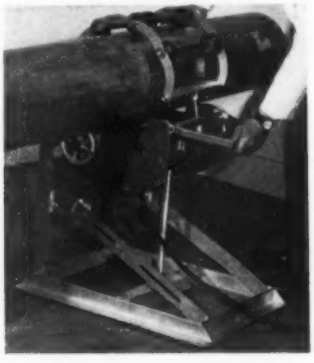
SHARPENING STONES—*Behr-Manning Div., Norton Co., Troy, N. Y.* Stock handling is simplified by color identification of the brands, and line identification by the wrapper design.

CUTOFF WHEELS—*Bay State Abrasive Products Co., Westboro, Mass.* Resinoid bonds reinforced with strong nylon fibers feature the construction of these Saf-T-Cut rough-sided wheels.



WHEEL HOLDER—*The Blanchard Machine Co., 64 State St., Cambridge, Mass.* A solid-wheel holder which eliminates sulphuring in the mounting of cylindrical grinding wheels. According to manufacturers it requires but a few minutes to change wheels when using it.

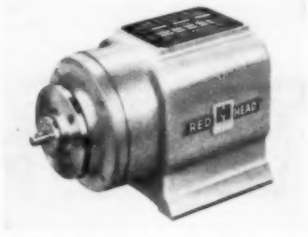
DISK FILE — *Kennametal Inc., Latrobe, Pa.* For snagging castings, cutting off flashings, and facing and squaring of surfaces on non-ferrous metals and plastics. Made by brazing courses of triangular prisms of strong Kennametal (90.0 Rockwell A) to the face of a steel backer plate, forming a multiplicity of sharp cutting edges.



ABRASIVE WHEEL — *Gilman Engineering & Mfg. Corp., Janesville, Wis.* Abrasive wheel is used for cutting of stainless steel on this portable tube-cutoff machine.

CUTOFF WHEELS—*Norton Co., 1 New Bond St., Worcester 6, Mass.* Norflex cutoff and sanding wheels, of reinforced constructions, are said to both provide fast cutting and to be virtually unbreakable.

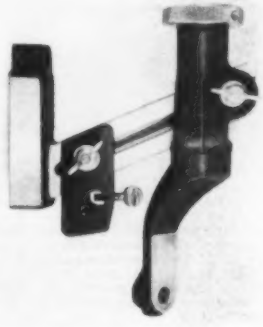
ABRASIVE WHEELS, POINTS — *Schupack Supply Co., Chicago, Ill.* Mounted on ¼-in. steel mandrels containing nine each of the 16 most popular sizes and types. These include straight wheels, cones, cups, and rounded burrs.



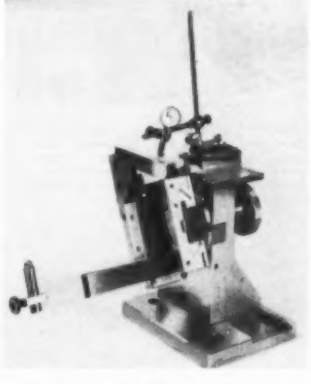
WHEELHEAD—*The Heald Machine Company, Worcester, Massachusetts.* Heald Red Head high-frequency wheelheads for internal grinding are available in eight different models covering a range from 6000 to 100,000 rpm.

GRINDING TOOLS—*Carboloy Company, Inc., Detroit 32, Mich.* Solid-Carboloy cemented-carbide grinding tools are for internal and jig grinding of small holes in both soft and hardened steels (up to Rockwell 65C).

CLUSTER TOOLS—*National Diamond Laboratory, 198 Fulton St., New York 7.* Type T is a T-shaped dresser containing many small, selected industrial diamonds. Type S consists of industrial diamonds set in a dome-shaped tungsten-carbide matrix.

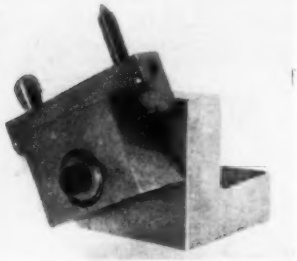


GRINDING-WHEEL DRESSER—*Detroit Industrial Products Co., 15244 Aubrey, Detroit 23, Mich.* One of the important advantages claimed for this three-way dresser is that it saves time and operator fatigue by taking the diamond point to the wheel instead of raising or lowering the wheel to the dresser.



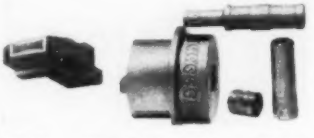
WHEEL DRESSER—*Universal Form Tool Co., 7410 Rutherford, Detroit 28, Mich.* This universal dresser is capable of dressing a series of angles with all locations held—rather than a single radius and angle tangent.

WHEEL CRUSHER ROLLS — *The Jerpbak-Bayless Co. Inc., Chagrin Falls, Ohio.* Rolls which permit the shaping of intricate single and multiple forms for grinding tools, dies, and production parts. To be utilized with standard Jerpbak-Bayless portable, motorized crushers.



ANGLE DRESSER—*Sperman Metal Specialties, 27 Columbia Place, Brooklyn 2, N. Y.* Dresser works underneath the grinding wheel, thus avoiding removal of the wheel guards. An operating handle keeps the mechanic's hand away.

SHARPENING FIXTURE — *Bokum Tool Co., Detroit 21, Mich.* Resharpening fixture, AB-1, consists of a rectangular base which is placed on a magnetic bed at right angles to the wheel and is expressly for all Bokum standard and extra-long tools, styles A and B from No. 0000 to No. 3.

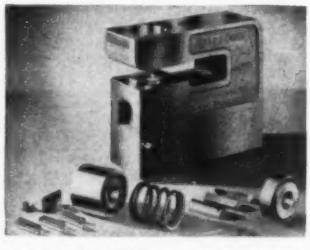


DIES — *The Parker Stamp Works, Hartford, Conn.* Hyper-honed finish is said to give Parker dies improved wearing qualities, rust resistance, less "down time," and more economical marking.

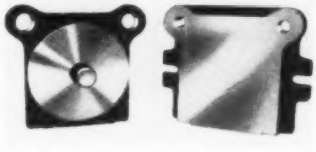
PUNCHES — *Richard Brothers Div., Allied Products Corp., 1560 E. Milwaukee Ave., Detroit 11, Mich.* Round punches have interchangeable feature in which a ballbearing lock in the retainer engages in the ball seat on the punch shank, providing secure positioning, both radially and vertically.

DIEMAKERS BUSHINGS — *Diemakers Supplies, Inc., 2779 E. Grand Blvd., Dept. 3, Detroit 11, Mich.* For metal guideposts they can be fitted closely providing maximum supporting alignment for costly punches and dies.

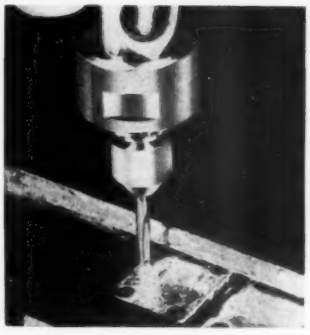
TAP REMOVER — *Clinton Machine Co., Metalmaster Div., Clinton, Mich.* Operated on any standard drillpress, the Metalmaster Junior removes broken taps from 0.08 to 1 in. and takes out any broken tools, taps, studs, reamers, pins, plug gages, and drills without distorting threads.



HOLE PUNCHERS — *Wales-Strippit Corp., 345 Payne Ave., North Tonawanda, N. Y.* Type-G units are equipped with split punches which are said to eliminate the large pressures and oversize springs usually associated with stripping punches out of holes.

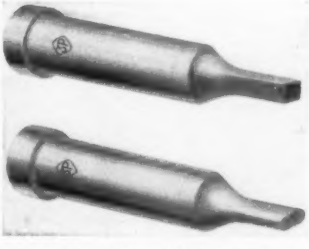


DIE SETS—*Detroit Die Set Corporation, Detroit, Mich.* All leader-pin holes and guide-bushing holes in Detroit standard die sets are now jig-bored. The precision-honed indicating and clamping planes are produced to the same degree of precision.



TAPS—*Woodruff & Stokes Co., Quincy 69, Massachusetts.* W-S small carbon-steel taps are available in standard or special sizes up to No. 2 (0.086 in.) and with up to 260 threads per inch. The cut thread and flutes are highly polished to reduce drag and fatigue.

SMALL-PRONG DIES — *Woodruff & Stokes, Quincy 69, Mass.* A line of dies is said to produce more uniform and smoother precision threads than has been possible heretofore.

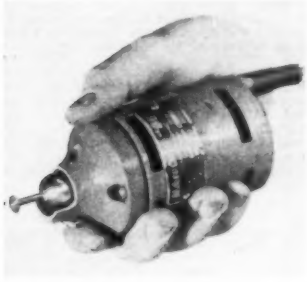


BUTTON-HEAD PUNCHES — *Porter Precision Products, P. O. Box No. 99, Cincinnati 31, Ohio.* Interchangeable piercing punches in standardized square and oblong shapes are manufactured from water-hardened tool steel.

DIE NIBS—*Carboloy Co., Inc., Detroit 32, Mich.* Standard header die nibs are available in 17 sizes ranging from 9/16-in. OD with 0.06-in. cored hole, ¾ in. long to 1¼-in. OD and 0.33-in. cored hole, 2⅛ in. long.

STOP-PINS—*Twentieth Century Mfg. Co., 3740 Montrose Ave., Chicago 18, Ill.* Stop-pins and finger-stops save time and expense of having toolmakers roll their own for each application in a die.

DIE NIBS —*Tungsten Alloy Mfg. Co., Inc., Newark, N. J.* Rough-scored uncased die nibs for collapsible-tube dies are stocked in eight sizes ranging from ⅝- to 1½-in. ID. and in the various grades of tungsten carbide.



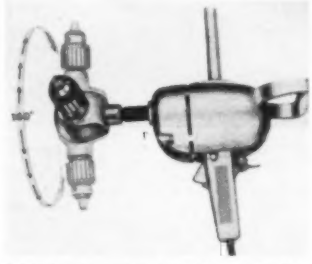
POWER TOOL — *Chicago Wheel & Mfg. Co., 1101 West Monroe Street, Chicago 7, Ill.* Balanced and shaped to fit the hand, the Handee '85 has an idling speed of 27,000 rpm and a load speed of 20,000 rpm. Forty-one matched attachments have been assembled into one case as a companion for the tool.

DRILL — *Cummins Portable Tools, Div. of Cummins Business Machines Corp., 4740 Ravenswood Ave., Chicago 40, Ill.* The Body Builder's Special is a drill designed for continuous use under severe conditions.

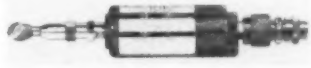
ELECTRIC DRILL — *Cummins Portable Tools, Div. Cummins Business Machines Corp., 4740 Ravenswood Ave., Chicago 40, Ill.* This electric drill turns in reverse at a flick of the toggle switch, eliminating hand turning and struggling to remove the bit from wood.

PORTABLE DRILL—*Speedway Mfg. Co., Cicero, Ill.* Weighs only 8¾ lb, but delivers a half horsepower at the drill point under normal load. Powered by a series-wound universal motor.

ELECTRIC SHEARS—*Stanley Electric Tools, New Britain, Conn.* Lightweight, portable electric shears that cut up to 14-gage hot-rolled steel at a speed of 15 to 20 fpm. A blade motion which feeds in the work, facilitates cutting of straight lines, curves, angles, and notches to close accuracy.



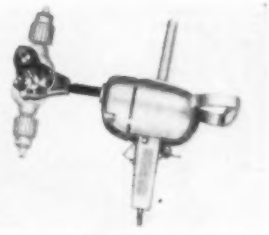
DRILL—*Cummins Portable Tools, Div. Cummins Business Machine Corp., 4740 Ravenswood Ave., Chicago 40, Ill.* Has an anglehead which is valuable for getting into tight spots often inaccessible with an ordinary drill. The head rotates through 360°.



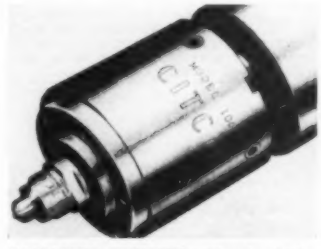
DIE GRINDERS—*Master Pneumatic Tool Co., Inc., Orwell, Ohio.* Short, heavy-duty air-power die grinders come in two models. Model M-612 has 1-in. spindle projection threaded ⅜ in. -24. Model M-613 has a 7/16-in. spindle projection, threaded ⅜ in. -24.

DISK GRINDER — *Craft-Hollow Industries, Wallingford, Pa.* Some features: 12,000-rpm General Electric motor; a weight of 4½ lb; a shape to permit hand use without employment of handles or knobs.

PORTABLE DRILL—*Skilsaw, Inc., 5033 Elston Ave., Chicago, Ill.* The Lamb handle on the Model 49, ¼-in. heavy-duty Skil drill is said to fit all hands, right or left, and eliminates squeezing, crowding, and overlapping of fingers.



SWIVEL DRILLHEAD — *Cummins Portable Tools, Div. of Cummins Business Machine Corp., 4740 Ravenswood Ave., Chicago 40, Ill.* Capable of swiveling 360°, this portable-tool attachment for ½-in. drills is for operations in hard-to-get-at spots.



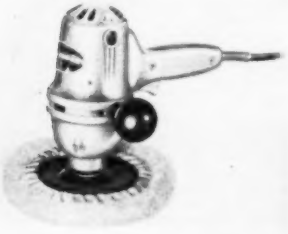
DIAMOND TURNER—*Cleveland Industrial Tool Corp., Cleveland, Ohio.* The Citco hydraulic diamond turner Model 1002-A turns and holds diamonds rigidly, and generates, on the diamond, a consistent sharp edge in any one of three ranges of degrees.

RIVET GUN—*Ripley Co., Inc., Middletown, Conn.* Gun uses Du Pont explosive rivets for high-speed operation. Only 2 sec are required for setting a rivet.

SANDER—*The Black & Decker Mfg. Co., Towson 4, Md.* The Junior sander weighs only 8 lb, has a cast-aluminum housing and heat-treated gears, and grease-sealed ball bearings throughout.

SANDER—*Buckeye Tools Corp., 21 W. Apple St., Dayton 1, Ohio.* The Stream-Power is equally adaptable to medium-duty sanding or light-duty cup-wheel grinding. Tools are said to be smaller and 10% lighter than previous models of equal capacity and provides 25% more power.

CHIPPING HAMMER — *Ingersoll-Rand Co., Phillipsburg, N. J.* Controlled-power chipping-hammer line offers a selection of 15 power sizes and five basic hammer sizes. Each basic hammer size is available in normal-cut, extra-cut, or super-cut models.



POLISHER—*Cummins Portable Tools, Div. Cummins Business Machines Corp., 4740 Ravenswood Ave., Chicago 40, Ill.* This cleaner-polisher also does sanding, drilling, portable grinding and wire brushing, bench-grinding and buffing, and rubbing.

WORKSTAND — *Pratt & Whitney, West Hartford 1, Conn.* Stand is of welded construction, 2 ft square, 30 in. high, and has a turntable on which heavy work can be rotated freely.

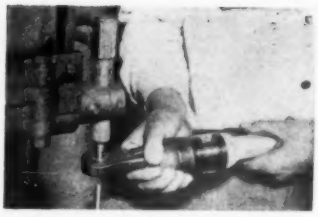
SCREW SOCKET—*J. H. Williams & Co., 400 Vulcan St., Buffalo 7, N. Y.* For driving case-hardened, self-tapping screws with power tools of all kinds.

CRIMPER—*Aircraft Marine Products Inc., 1577 N. 4th St., Harrisburg, Pa.* Air-operated unit for crimping solderless terminals to wire. Heads are detachable to facilitate either conventional side or "stub"-position crimping.

NUT-RUNNING TOOLS — *Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.* Two air-operated impact tools the size 504 for nut-running up to $\frac{5}{8}$-in. bolt size and the size 510 for nut-running up to $\frac{3}{4}$-in. bolt size are 20% more powerful and 65% faster than the old model and are muffled.

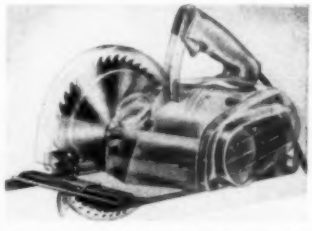
COUNTERSINKING TOOL—*Buckeye Tools Corp., Dayton, Ohio.* This tool does the countersinking of drill holes in Boeing bombers in 30 to 40 sec as opposed to the 3½ min formerly required. The operation is almost completely automatic in that no pushing effort is required on the part of the operator.

FLEXIBLE - SHAFT MACHINE — *Foredom Electric Co., 27 Park Pl., New York, N. Y.* The 900 series machines can be set anywhere to suit the requirements of the job at hand. Shaft runs in a metal casing, reinforced with tough, oil-resistant neoprene.



PNEUMATIC TOOL—*Keller Tool Co., Grand Haven, Mich.* The demand for a fast, easy-to-use tool for redressing round electrodes of single or multiple-point welding machine is said to have been answered by this tool.

NUT SETTERS—*Keller Tool Co., Grand Haven, Mich.* Two models of nut setters, 16C-43 and 16C-46, are designed with 12:1 gearing in the gear case which, coupled with 1:1 and 2:1 gearing respectively in the angle attachments, provides torques of 30- and 60-ft lb.



ELECTRIC SAWS—*Syntron Co., 311 Lexington Ave., Homer City, Pa.* Dual V-belts from the motor shaft to the saw arbor-shaft, drive this portable electric saw.

PORTABLE SAWS—*The Black & Decker Mfg. Co., Towson, Md.* Said to cut faster than abrasive disks when sawing abrasive or plastic-composition materials.

BIT AND SAW—*International Twist Drill Corp., 7th & Wyandotte, Kansas City, Mo.* The Miller rotary high-speed cope-saw drill bit fits any standard electric drill or drillpress and is designed to drill its own starting hole.

BANDSAW ATTACHMENT — *Alois Steiner Lathe Saw Attachment, 1014 Washington St., Hoboken, N. J.*—Materials 8 in. thick can be cut by this bandsaw attachment. It fits lathes with from 9- to 16-in. swing, and all milling machines.

SCREWDRIVER — *Pentagon Metal Products Corporation, 121 New Jersey Railroad Ave., Newark 5, N. J.* Screwdriver for attachment to ¼-in. electric hand drill or drillpresses. A friction-clutch arrangement is said to insure smooth, efficient operation.

ELECTRIC HANDSAW — *Portable Electric Tools Inc., 320 W. 83rd St., Chicago 20, Ill.* Features include: Universal 115-120 volt, ac-dc fan-cooled motor, dynamically balanced armature, bronze helical gears and self-oiling bearings.

HAMMER—*The Mondie Forge Co., 10274 Berea Road, Cleveland 2, Ohio.* All-purpose mechanic's hammer combines on one handle a drop-forged steel head and a rubber head. The medium-hard rubber head is said to have a low blow-recoil factor.

HAMMER—*Ready Tool Co., Bridgeport, Conn.* The 12-oz Tap-A-Hammer, for work demanding a direct tap rather than an uncertain leverage blow, has tappers on both ends made of a compressible plastic material, said to absorb the shock of the tap.

HAMMER — *Greene, Tweed & Co., North Wales, Pa.* The metal parts of this replaceable-face hammer are finished in rust-inhibiting aluminum coating. The jaws of the retaining head have play to insure positive take-up.

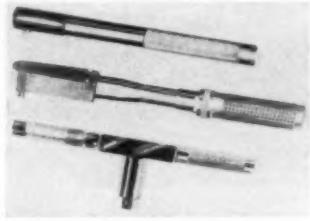
BRONZE HAMMER — *Univertical Machine Co., 14831 W. 11-Mile Road, Berkeley, Mich.* The Safe-T-Hammer is a bronze implement for use in place of copper and brass hammers where hard blows must be struck without injuring delicate machine surfaces.

SOCKET WRENCH—*Vincent Peluse, 6 Mt. Carmel Pl., Poughkeepsie, N. Y.* A universal joint incorporated in the handle of a socket wrench provides for offset screwdriver and wrench work.

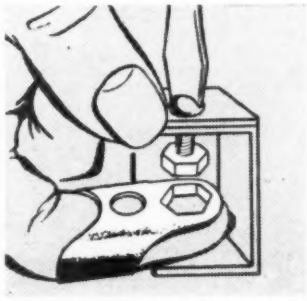
SCREW STARTER—*Owatonna Tool Co., 383 N. Cedar Street, Owatonna, Minn.* Magnetic starter fits all sizes of Phillips, Reed, and Prince recessed-head screws. The bits are built of heat-treated alloy steel and are permanently magnetized.

CENTER PUNCH—*Magnet-Hold Perfect Center Punch Inc., 837 Central Park Ave., Yonkers 4, N. Y.* Magnet-Hold center punch has a powerful Alnico magnet which holds the bushing directly in center when the four sharp corners are lined up with the layout lines.

HAMMERS—*Gregory Tool & Mfg. Co., 25946 West 7 Mile Road, Detroit 19, Mich.* Hammers with a hand grip shaped to comfortably fit the palm and grooved to prevent turning in the hand, renewable tips, and with the ferrules made of brass tubing.



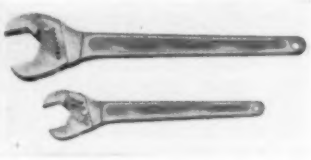
TORQUE WRENCH — *JO Manufacturing Co., 8442 Otis St., South Gate, Calif.* Torque wrenches covering a range from 2 to 36,000 in.-lb. There are no dials or gages to watch and tension breaks automatically when proper torque value is reached.



FINGERTIP WRENCHES — *F. E. Redfield Co., 31 Colonial Parkway, Dumont, N. J.* Touch 'N' Grip fingertip wrenches make it easy to place, hold, and tighen nuts in out-of-the-way or out-of-sight locations.

SPECIAL WRENCHES—*Federal Tool Mfg. Co., Dept. AM, 3600 Alabama Ave., Minneapolis 16, Minn.* Open-end, box, spanner, and special types of wrenches up to ⅛ in. thick, for special applications, are made to purchaser's specifications.

BLOCK AND PUNCH SET — *Tweco Products Co., Wichita 1, Kansas.* This set mechanically installs the company's new line of lugs and splicers—which are designed especially for welding cables.

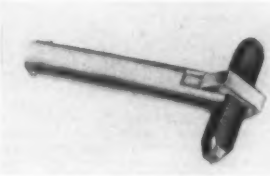


WRENCHES — *Owatonna Tool Co., 383 No. Cedar St., Owatonna, Minn.* Alloy - steel drop - forged wrenches adjust to 29 sizes, normally serviced by fixed-size carbon-steel wrenches.

INTERNAL PIPE WRENCHES—*Roddick Tool Co., 112 Rochester St., Costa Mesa, Calif.* Available in a broader range of sizes including ⅛-, 2½-, 3-, and 4-in. sizes. For installation or extraction of fittings in close quarters.

BOLT LOOSENER—*H. K. Porter, Inc., Somerville, Mass.* Constructed on a cam principle that translates the impact from a hammered blow into torque. Useful for starting stubborn nuts, bolts, or screws that are rusted or frozen on.

SOCKET WRENCHES—*Plumb Tool Co., Los Angeles, Calif.* Addition of 20 single - hexagon (6-point) thin - wall socket wrenches to the PROTO line has been announced.

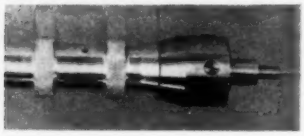


HAND-TOOL HOLDER—*M. E. Cunningham Co., 95 E. Carson St., Pittsburgh 3, Pa.* The lightweight Luminum-Lined holder is designed to prevent smashed fingers in the use of steel stamps, cold chisels, drifts, and punches. Slotted head section can be pushed out and stamps changed with only first finger and thumb.

SMALL-TOOL KIT — *The Palmer Wellcot Tool Co., Meadville, Pa.* Kit of Wellcot tools, assembled in a transparent plastic case, contains general utility pliers, self-gripping angle-nose pliers, blunt nosed forceps, and a screwdriver.

CENTER PUNCH—*Black Drill Co., 1500 East 222nd Street, Cleveland 17, Ohio.* This tool is designed for use with hard-steel drills to avoid breakage because of "walking" on ground or curved surfaces.

CENTER PUNCH — *Vinco Products, 915-17 Asbury Ave., Asbury Park, N. J.* Model C-15 R automatic center punch is an improved model with an adjustment sleeve to permit visual variation of spring pressure from 5 to 35 lb.



TORQUE-CONTROLLED SCREWDRIVER—*Overload Control Co., 260-63 Langston Ave., Glen Oaks, L. I., N. Y.* A given value of applied torque will automatically disengage this mechanically operated screwdriver. Preset in the factory for any cutoff value desired.

SCREW DRIVER — *Vaco Products Co., 317 E. Ontario St., Chicago 11, Ill.* Equipped with a screw holder in the form of a spring clip which may be slid back up the shaft and out of the way when not needed.

SCREWDRIVER—*Kedman Co., 233 S. 5th St., Salt Lake City 1, Utah.* Called Quick-Wedge, has a double spring-steel blade that holds, starts, and drives the screw.

SCREWDRIVER—*H. D. Hunter & Co., 4476 Union Pacific Ave., Los Angeles 23, Calif.* Screwholding screwdriver has rotating hardened-steel pin in the center of the blade which tightens the grip on the screw as force is applied to turn it.

INSERT BITS—*Hy-Pro Tool Co., New Bedford, Mass.* These insert bits are claimed to have 25% longer life than bits formerly used, and as much as double or triple durability on the more exacting jobs.

PLIERS—*B. Jadow, Inc., 860 Broadway, New York, N. Y.* Vigor pliers are made of Swedish steel, forged and hand machined to produce high-precision instruments.

WRENCHES—*J. H. Williams & Co., 40 Vulcan St., Buffalo 7, N. Y.* Williams 45 and 90° bent-handle construction wrenches facilitate work in close quarters where maximum accessibility and leverage are required.

SPEEDRATCHET — *Herbrand Div., The Bingham-Herbrand Corp., Fremont, Ohio.* The Speedratchet may be used as a palm-grip T-handle, as ratchet and extension, as maximum-clearance speeder, or as a counterbalanced spinner. Fits any ⅜-in. drive series.

TOOLS—*Delaware Tool Steel Corp., Wilmington, Del.* Safe-T-Kut line of tools includes hand chisels, pneumatic- and electric-hammer chisels, and center punches. Each tool is magnetic-particle inspected.

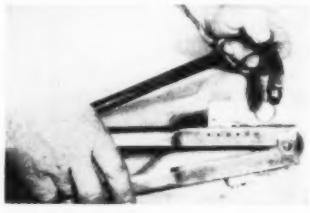
TOOL — *The Baker Co., Maplewood, Maine.* For placing or removing ball bearings. Said to be designed so that the force is not applied through the balls or races.

FILE HANDLES — *Lauber Handle Mfg. Co., 3240-42 West National Ave., Milwaukee 4, Wis.* Reusable file handles which fit any tool with a tang, cut their own threads with tapped metal inserts.

HACKSAW—*Ziskind Co., Inc., 49 W. 37th St., New York 18, N. Y.* This endless hacksaw will do many jobs an ordinary saw cannot do, such as sawing out parts of floor boards, wall panels, metal doors, etc.

HACKSAW BLADE—*Clemson Bros. Inc., Middletown, N. Y.* Subjected to a special heat-treatment, the Star Molyflex hacksaw blade is said to combine extreme flexibility plus high cutting qualities.

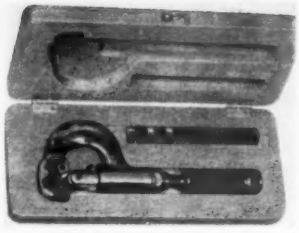
HACK-SAW ATTACHMENT — *Bertram Engineering & Supply Co., 3121 Main St., Kansas City, Mo.* Claimed to be lighter, more compact, cheaper, and more simply operated than any other such unit on the market.



CRIMPING TOOL—*A. Schrader's Son Div., Scovill Mfg. Co. Inc., 470 Vanderbilt Ave., Brooklyn 17, N. Y.* Lightweight tool is for crimping metal ferrules when making hose repairs. Two strands of music wire in looped form, attached to the operating handles effect the crimp.

COPING SAW — *Dock's Tools, 2160 Sunset Blvd., Los Angeles, Calif.* Has a spiral blade which is claimed to prevent chipping or burring.

SPIRAL-BLADE — *Dock's Tools, 2160 Sunset Blvd., Los Angeles, Calif.* Hacksaw set that consists of three blades and a pair of holders.

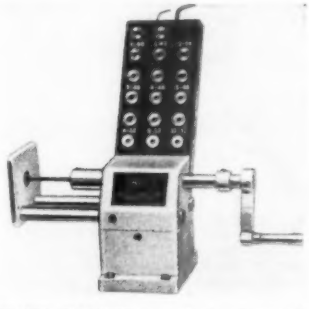


KNURLING TOOL—*Wade Tool Co., Waltham, Mass.* Designed primarily for knurling of long, slender work which would bend under normal knurling pressure, this tool is built like a steady rest.

SHEARS BOLTS — *Aircraft-Marine Products Inc.'s Independent Distributor Div., 1601 N. Front St., Harrisburg, Pa.* Hand tool 49835 incorporates jaws for crimping solderless terminals with a cutting, stripping, and bolt-shearing device.

CARBIDE-EDGED CUTTERS—*H. K. Porter, Inc., Somerville, Mass.* Cutters which have tough carbide edges brazed to the cutting jaws are designed for cutting extremely hard material.

STRAP CUTTER—*A. J. Gerrard & Company, Melrose Park, Ill.* The tapered lower jaw on this strap cutter can be inserted easily under the tightest strap.



HAND TAPPER — *Photo Research Corp., Burbank, Calif.* A hand tapper for screw threads from 0-80 to 10-32 is known as the "Tapit." It can be operated bolted to a bench, or the upper half can be held in a vise or taken to the work.

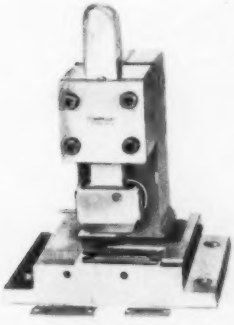
BIT HOLDERS—*Magna Tool Corp., Buffalo 3, N. Y.* Ten times the "pull" of ordinary magnetic tools is claimed for these bit holders and hex drivers.

TUBE-FLARING KIT—*Papco Tools, Penn Brass & Copper Co., Erie, Pa.* The Form-A-Gage, included in this kit, serves as a height gage for five sizes of tubing, determining the exact amount required for crimping prior to double flaring. Also includes a flaring punch, and a tube cutter.

MAGNETIC LEVEL — *The Buckeye Plastic Corp., 740 Superior Ave., N.W., Cleveland, Ohio.* Equipped with two Alnico permanent magnets, the Mago-Level sticks to either round or flat surfaces at any angle.

LEVEL ATTACHMENT—*Singer Kennedy Corp., 21 E. Van Buren St., Chicago 5, Ill.* For all makes of electric hand drills. Enables the user to drill straight holes horizontally, vertically, or at any angle.

DRAW BAR — *Patterson Equipment Co., Denair, Calif.* Pump operated, it is claimed to have the following advantages: pulls ½-in. to 4-in.-size conduit holes without manual exertion; eliminates danger of short-circuiting adjacent wire; will not warp, break, tear or distort metal.

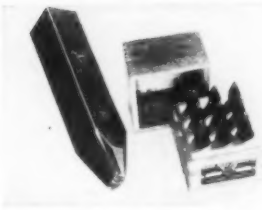


HAND-STAMPING FIXTURE—*M. E. Cunningham Co., 95 E. Carson St., Pittsburgh 19, Pa.* Model SF-100 fixture is made of special Mecco Safety Steel to prevent spalling, mushrooming, and injury to personnel.

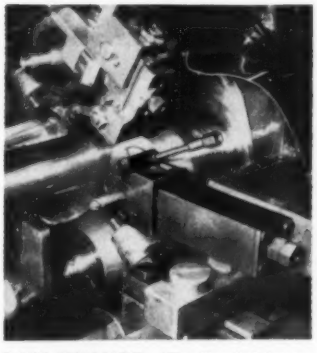
MARKING TOOL—*M. E. Cunningham Co., 95 E. Carson St., Pittsburgh 19, Pa.* Multiple marking device for stamping steel sheet is made from aluminum and has the top swiveling upward so that the holder can be slipped over the pieces to be marked.

HAND STAMP—*Quality Die Co., 9308 S. Baltimore Ave., Chicago 17, Ill.* Hand stamps are obtainable from stock with popular descriptive words, steel trade names, codes, serial numbers, fractions, etc.

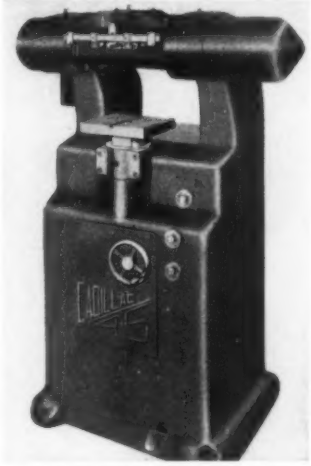
PAINT-STICK MARKER — *Lake Chemical Co., 3052 W. Carroll Ave., Chicago 12, Ill.* Lacquer-Stik is a semi-solidified paint in stick form, developed for fill-ins of stamped, engraved, or etched markings and designs on smooth-surface material.



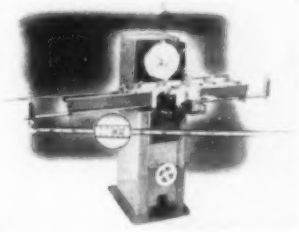
STAMP SET—*Acme Marking Equipment Co., 8039 Lyndon, Detroit 21, Mich.* Fractional-figure stamps are made of high-grade tool steel, blued for rust-prevention. The set consists of nine stamps reading from ⅛ to 1 in. in eighths and includes a separate inch sign.



ROLL-STAMPER—*The Special Screw Products Co., 5445 Dunham Rd., Bedford, Ohio.* The Automarx marking device roll-stamps part numbers or trade marks on metal parts as they are processed in multiple-spindle screw machines.



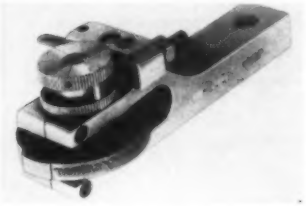
HYDRAULIC MARKER — *Cadillac Stamp Co., 2138 Riopelle, Detroit 7, Mich.* One control on the Cadillac 45 gives full range of marking depth and up to 12,000 psi can be applied for a wide variety of marking requirements.



SCALE-MARKING MACHINE — *The Noble and Westbrook Mfg. Co., East Hartford 8, Conn.* Lineal graduations and numbers are permanently rolled into such articles as typewriter-paper bail bars by the Model 306 machine.

MARKING MACHINE—*The Noble & Westbrook Mfg. Co., East Hartford 8, Conn.* Such articles as studs, rods, and bushings can be marked on this machine. Constructed with a horizontally positioned main spindle with a vertical carrier dial.

RULING MACHINE FOR SCALES—*The Gaertner Scientific Corp., 1201 Wrightwood Ave., Chicago 14, Ill.* Lines can be ruled on horizontal, beveled, or cylindrical surfaces of any machinable material at speeds up to 60 lines per min with this fully-automatic machine.



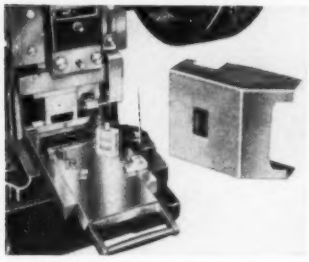
ROLL MARKER—*New Method Steel Stamps, Inc., 147 Jos. Campau, Detroit 7, Mich.* Automatic marker, which permits die marking of screw machine parts during the machine cycle, eliminates the need for separate setups, and reduces handling time and scraps.

METAL MARKING STAMPS—*Acme Marking Equipment Co., 8030 Lyndon, Detroit 21, Mich.* Produced in a set of 36 stamps containing 31 fractional figures, separated by 32nds, and the whole numbers 1, 2, and 3, as well as a dash and an inches sign.

REVOLVING STAMP HOLDER—*The Acromark Co., 7-13 Morrell St., Elizabeth 4, N. J.* Makes individual steel letter and figure stamps more readily available.

MARKING HOLDER — *Numberall Stamp and Tool Co., Huguenot Park, Staten Island 12, N. Y.* The Model 22 alloy-steel holder is for light-duty marking in brass, aluminum, or cold-rolled steel and can accommodate all sizes of characters up to 5/32 in. high.

ROLL-MARKING DIE HOLDER — *The Parker Stamp Works, Inc., Hartford, Conn.* 100 Series have a taper-lock feature which assures positive locking and self-centering of any type combination in the longitudinal direction.



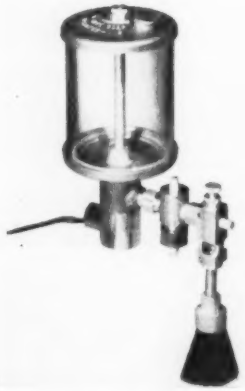
MARKING—*The Acromark Co., 7-13 Morrell St., Elizabeth 4, N. J.* Mounted in a standard die set for assembly in precision power presses, this unit is equipped with a slide-style interchangeable holder and a consecutive-action automatic numbering head.

COUNTER-WHEEL MARKING MACHINE—*Acromark Co., 382 Morrell St., Elizabeth 4, N. J.* A redesigned fixture coupled with precision tooling is said to allow the Model 9A to mark metal and plastic counter wheels, meter wheels, and similar parts with greatly increased accuracy.

STAINLESS - STEEL MARKING — *Stainless Ornamentals, Inc., 12 Harcourt St., Boston, Mass.* A process called Ateen-Ate treats blackened stainless steel to produce permanent designs or markings.

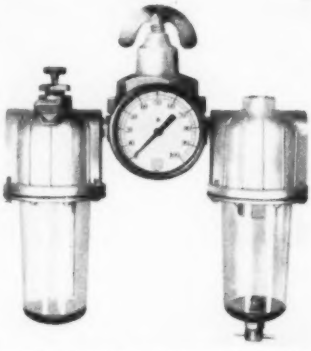
MARKING TOOL—*Handicraft Div., Burgess Battery Co., Lake Zurich, Ill.* The Burgess Vibro-tool is equipped with a tantalum-carbide point and writes on steel or any other metal, plastic, wood, glass, or ceramic surfaces.

STAMPING FIXTURE—*E. M. Cunningham Co., 95 E. Carson St., Pittsburgh 19, Pa.* An improved retaining feature has been incorporated in this stamping fixture. It allows the characters to stamp on a specified curved radius.

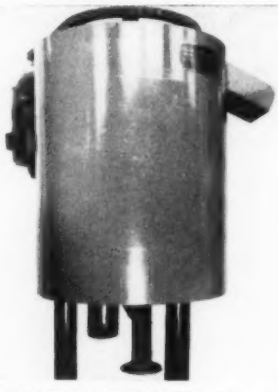


SOLENOID - OPERATED OILER—*Oil-Rite Corp., Milwaukee 15, Wis.* Automatic chain oiler assures positive lubrication whenever the chain is running and eliminates need for applying lubricant by hand. Lubricant is fed by gravity from a reservoir.

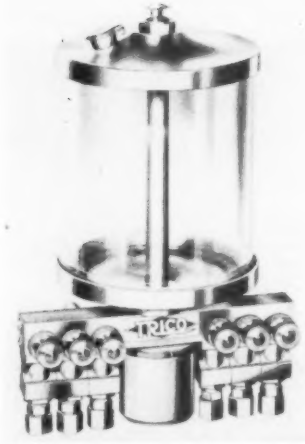
AIRLINE LUBRICATOR — *Keller Tool Co., Grand Haven, Mich.* Automatic lubrication for air tools using 10 to 60 cfm is provided by the Air Line Lubricator. The bowl provides oil feed through a porous bronze wick into the air stream.



LUBRICATION — *Airlube Inc., 3422 West North Ave., Chicago 47, Ill.* Complete compressed-air control unit provides constant, clean, lubricated air for working surfaces.

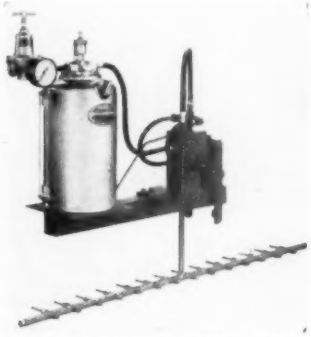


MAGNETIC SEPARATOR—*Magnetic Engineering & Mfg. Co., Clifton, N. J.* The Memco separator is designed to remove ferrous particles from cutting and lubricating oils. Standard sizes range from 18-in. OD, 40 to 60-gpm feed capacity to 60-in. OD, 250- to 300-gpm capacity.



MULTIPLE-FEED OILER — *Trico Fuse Mfg. Co., 2948 N. 5th St., Milwaukee 12, Wis.* A centralized system of lubricating 1 to 20 bearing points on machine tools, and similar applications. When a solenoid is energized, oil feeds to all lines, and stops feeding when current is shut off.

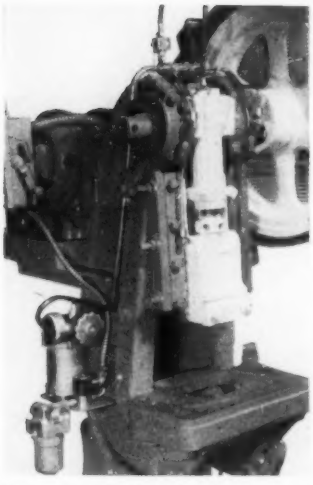
GRAVITY-FEED OILER—*Trico Fuse Mfg. Co., 2948 N. 5th St., Milwaukee 12, Wis.* Oiler with a ratchet control mechanism for adjustment of the oil feed. A spring mechanism locks the adjustment.



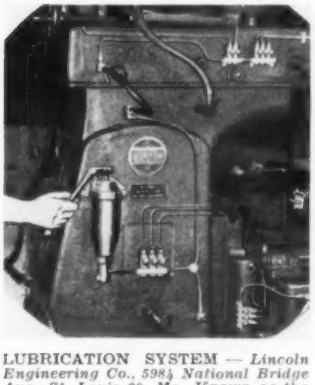
CONVEYOR LUBRICATOR — *J. N. Fauver Co. Inc., 49 W. Hancock Ave., Detroit 1, Mich.* The manifold of this lubricator has 14 outlets, 2⅝-in. apart, to lubricate chain-link pins that are relatively closely spaced.

MOLYBDENUM LUBRICANT — *The Lockrey Co., College Point, N. Y.* Liqui-Moly is a treated compound of the greasy metal, molybdenum. It forms a lubricating film that cannot be squeezed out by pressure, and which can withstand extremes of temperature.

AUTOMATIC LUBRICATION—*Graymills Corp., Evanston, Ill.* For stamping and forming of roll, strip, and sheet stocks. The system is said to insure complete lubrication coverage even when heavy lubricants are used.



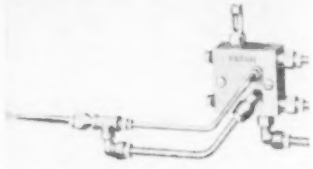
MIST LUBRICATION—*Alemite Division, Stewart-Warner Corp., Chicago, Ill.* Lubricating system automatically delivers a constant stream of airborne oil particles. Virtual elimination of the human factor in lubrication, drastic economy in lubricant consumption, and prolonged bearing life are among the claims made for the system.



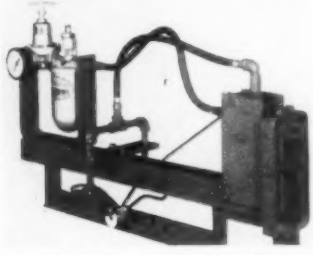
LUBRICATION SYSTEM — *Lincoln Engineering Co., 5984 National Bridge Ave., St. Louis 20, Mo.* Known as the CenterOiler, this system provides centralized lubrication for all machine bearing points requiring periodic applications of oil.

LUBRICANT—*The Lockrey Co., College Point 1, N. Y.* Molybdenum-base lubricant, Liqui-Moly, can be applied alone or added to other oils. It plates out on the metal, providing a permanent, low-friction, anti-seizing coating.

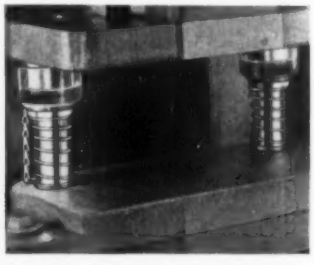
LUBRICANT—*Wayne Chemical Products Co., 9473 Copeland, Detroit 17, Mich.* A heavy paste that can be thinned with light lubricating oil is a non-poisonous substitute for white lead as a production lubricant.



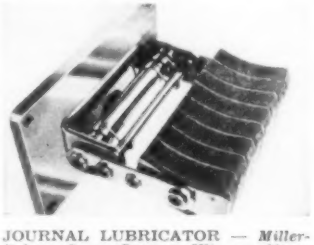
SPRAY VALVE — *The Farval Corp., 3251 E. 80th St., Cleveland 4, Ohio.* Spray valve sprays grease or oil onto any desired area, in any desired amount, and at any desired interval. The quantity of air used is limited to the amount needed to spray each delivery of oil.



LUBRICATOR—*J. N. Fauver Co, Inc., 49 West Hancock, Detroit 1, Mich.* This unit automatically lubricates bearings in 1¼-in. dia wheels which run on a T-Beam.



DIE-SET OILERS—*The Die Supply Co., 5349 St. Clair Ave., Cleveland 3, Ohio.* Longer life for pins and bushings, less down-time, and better die performance are claimed to result from use of Die-Co oilers. Each cup is made of clear plastic, molded to an aluminum insert.



JOURNAL LUBRICATOR — *Miller-Felpax Corp., Dept. 1, Winona, Minn.* The Felpax lubricator for journals on overhead cranes and similar industrial equipment has non-glazing felt wicks attached to the holders and kept in place with the correct pressure.

AIR-FILTER LUBRICATOR — *Logansport Machine Co., Logansport, Ind.* The R-F-L unit incorporates piston-type instead of bellows-type regulator, and the synthetic filtering element takes the place of the former porous-metal air filter.

CARTRIDGE REFILLS — *Honan-Crane Corp., 701 Indianapolis Ave., Lebanon, Indiana.* S-type cartridges have been added by Honan-Crane to their line of cartridge refills. The S cartridge contains 4½ lb of Palconia tightly packed in woven-cotton-sock material.

PORTABLE LUBRICATOR — *Louisville Electric Co., Inc., Louisville 11, Ky.* When the control valve of the Pioneer electric lubricator is pressed, a 5000-psi shot of lubricant is squirted into the part being serviced. Pressure remains constant.

GREASE—*Keystone Lubricating Co., 21 and Lippincott Sts., Philadelphia 32, Pa.* For open-gear service. Claimed to be extremely tenacious and highly absorptive in character.

OIL-DISPENSER — *Honan-Crane Corp., 701 Indianapolis Ave., Lebanon, Ind.* The Houdaille oil-dispensing unit is recommended for such plant applications as servicing. The fully inclosed vacuum pump and 1/3-hp motor are operated by a single switch.

ELECTRIC POWERGUNS — *Alemite Div., Stewart-Warner Corp., 1826 Diversey Pkwy., Chicago 14, Ill.* Of 25- and 40-lb grease capacity, give pressures up to 5000 lb, and include a 113-v 60-cycle universal motor with heavy-duty switch that shuts off automatically when that maximum pressure is reached.

ALL-PURPOSE LUBRICANT — *The Warren Refining & Chemical Co., 750 Prospect Ave., Cleveland 15, Ohio.* Has no melting point, and is said to possess greater adhesive qualities and excellent pumpability at low temperatures.

GRINDING COOLANT — *Swan-Finch Oil Corp., RCA Building West, New York 20, N. Y.* Safco 770 Compound has the consistency of a liquid paste and is recommended for both grinding and machining operations. It is a soluble all-purpose coolant base which is mixed with water in ratios as high as 80 to 1.

CUTTING OILS—*Gulf Oil Corp., 722 Gulf Bldg., Pittsburgh 30, Pa.* Electrode cutting oils made by Gulf have a lighter color and contain highly active sulfur.

CUTTING OILS—*Gulf Oil Corporation, 722 Gulf Bldg., Pittsburgh 30, Pa.* Improvements claimed for Lasupar oils include better cutting ability, and anti-rust properties.

GREASE — *Master Lubricants Co., Philadelphia, Pa.* For anti-friction bearings it is said to give satisfactory performance under both very high and extremely low temperature conditions.

COOLANT SEPARATOR — *Barnes Drill Co., Chestnut St., Rockford, Ill.* Compact No. 00 magnetic coolant separator can be placed in the coolant storage tank to remove metal particles and fused abrasives. Can clean 1½ gpm.

ROLLER COATING MACHINE—*L. R. Wallace & Co., 440 Seaton St., Los Angeles 13, Calif.* Coats any flat surface with oil, lacquer, enamel, or adhesive. The thickness can be controlled by a simple adjustment.

LUBRICANT PUMP—*Trabon Engineering Corp., 1814 East Fortieth St., Cleveland 3, O.* Fully hydraulic and progressive action of the Model 3400 lubricant pump, according to the manufacturer, make it impossible to skip or under-lubricate a bearing.

HI-TEMP OIL—*Swan-Finch Oil Corp., RCA Bldg. West, New York 20, N. Y.* A light-colored, carbon-free, high-temperature, lubricating oil for lubrication of bearings and chains subjected to severe operating temperatures.

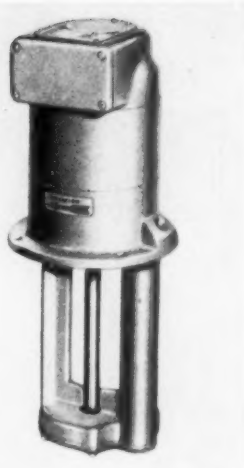
NON - CORROSIVE LUBRICANT—*Chicago Mfg. and Distributing Co., 1928 W. 46th St., Dept. AMP, Chicago 9, Ill.* For diesel guide pins, it is claimed to have excellent cleaning qualities.

COOLANT SYSTEM—*W. A. Horejsi Co., Dept. AM, 2001 James Ave., N., Minneapolis, Minn.* Coolant-supply unit consists of a heavy steel tank, a foot pump, 3 ft of plastic hose, and a nozzle attachment with bracket that can be attached to practically any machine.

COOLANT SYSTEMS — *Graymills Corp., Evanston, Ill.* These self-contained gear or centrifugal units are supplied in 1/25, 1/12, 1/8, 1/4, and 1/2 hp sizes. As little as 5 to 20 minutes is said to be required to convert machine tools to wet cutting.

COOLANT—*F. E. Anderson Oil Co., Portland, Conn.* Local coolant is a clear solution, allowing good vision of the tool. It is water soluble, and causes no skin irritation.

FINISHING FILM—*Metal Finishing Div., Pyrene Mfg. Co., 10 Empire St., Newark 5, N. J.* Processes that produce a solid graphite film or "dry" lubricant impregnated into the surfaces of metals, plastics, rubber, and ceramics are reducing friction and wear, making metal finishing more successful.

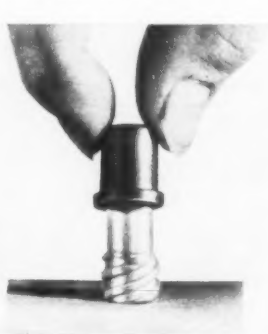


COOLANT PUMP—*The Ruthman Machinery Co., Cincinnati 2, Ohio.* The impeller housing, spacer supports, mounting flange, and lower motor-end belt, consist of one casting in this Gusher machine-tool coolant pump.

EMULSION OIL—*Turco Products Inc., 6135 S. Central Ave., Los Angeles 1, Calif.* Cutting oil deposits a light, rust-preventive film on work and tools while performing primary functions of lubrication and cooling.

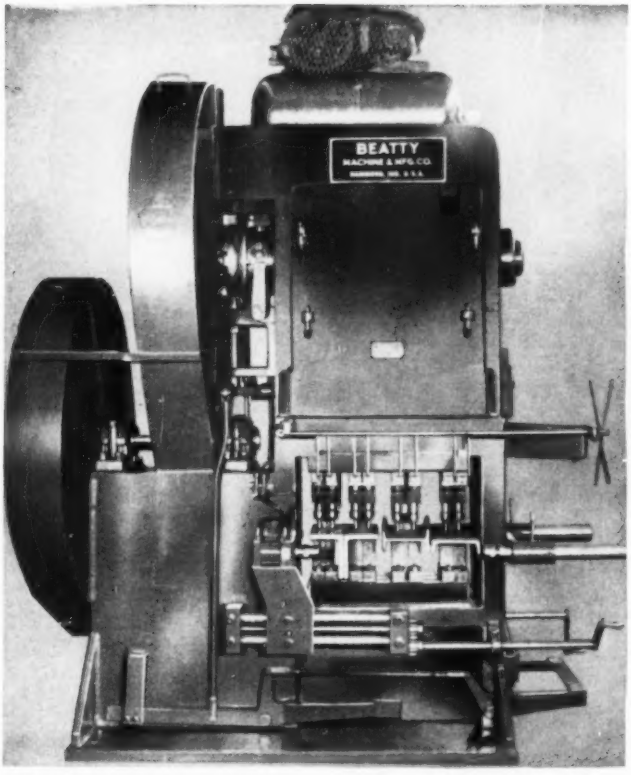
OIL-WATER EMULSION — *Hanson-Van Winkle-Munning Co., Matawan, N. J.* Tripoli composition is claimed to have excellent cutting qualities with an unusually high coloring ability.

LUBRICANT ADDITIVE — *Friction-Proof Oil Corp., 200 Fifth Ave., New York 10, N. Y.* Power Ball is an oil base which added to any lubricant, creates a thin film on lubricating parts, reducing friction.

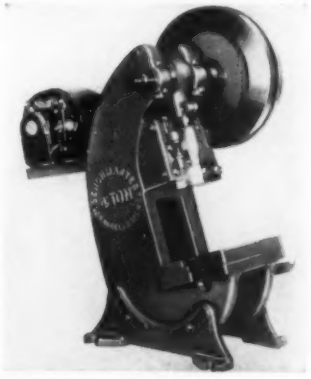


PLASTIC CAPS—*S. S. White Dental Mfg. Co., Plastics Div., 10 E. 40th St., New York 16, N. Y.* Elastoplastic caps are designed to fit over ⅜-in. Alemite dot fittings to prevent dirt from lodging on the tip. Made of black flexible vinylite.

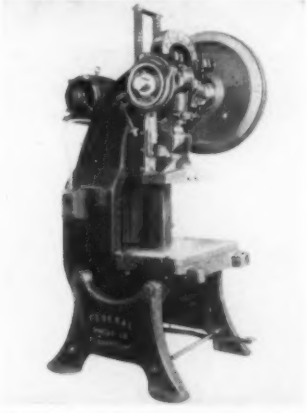
Forming, Forging, Casting



SHAPE PUNCH—*Beatty Machine & Mfg. Co., Hammond, Ind.* Equipped with air-operated clamps against adjustable fixed stops and gag operating levers for machine operation from the right side. Adjustable strippers, jaw clutch with auto stop at the top of stroke, and anti-friction flywheel-shaft bearings are in the unit.

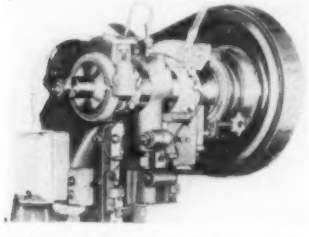


PUNCH PRESS — *Benchmaster Mfg. Co., 2952 West Pico Blvd., Los Angeles 6, Calif.* Increased tooling height has been added to the 4-ton Benchmaster punch press. Where open height, ram up, was formerly 6¾ in., this model now possesses a full 8 in.

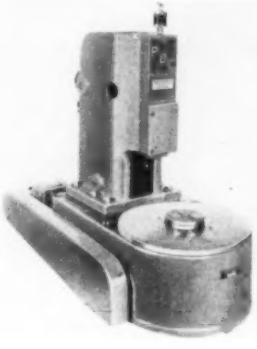


35-TON PRESS—*Federal Press Co., Elkhart, Ind.* No. 44 has an extra-long stroke, shut height and throat depth. Throat depth is 11½ in.

PRESS—*Sales Service Machine Tool Co., 2363 University Ave., St. Paul 4, Minn.* The 85-ton open-back inclinable Press-Rite power press has a one-piece alloy frame with built-in tierods.



PUNCH PRESSES—*L. & J. Press Corporation, Elkhart, Indiana.* Higher rate of engagements per min without heating, higher operating speeds, and less starting shock are obtained on inclinable punch presses through use of friction clutches.



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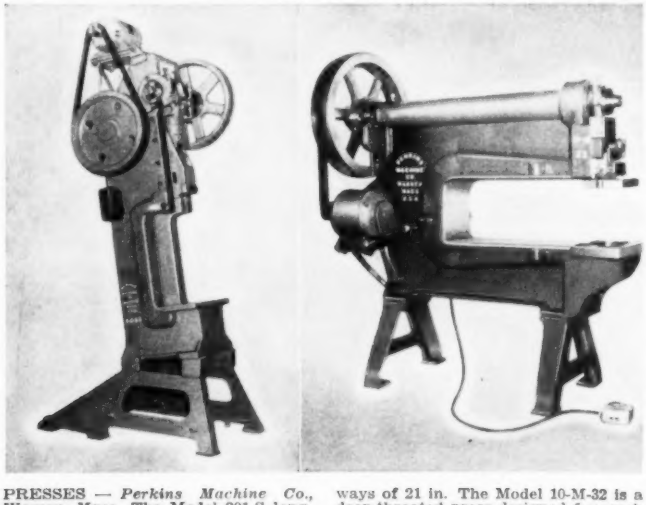
ASSEMBLY PRESS — *Prevision Detroit Co., Detroit 14, Mich.* Index table of the PDC automatic press has a six-station dial of 14½-in. dia, is powered with a ¼-hp electric motor, and driven by a positive-locking Geneva motion, running in an oil bath.

UNDER-DRIVEN PRESSES—*E. W. Bliss Co., Toledo, Ohio.* A line of 4-point under-driven eccentric presses feature easy accessibility of all parts, minimum service requirements, and heavy construction. All bearings are arranged to permit the shafts to be dropped straight down, without the necessity of pulling.



PRESSES — *Perkins Machine Co., Warren, Mass.* The Model 201-S long-stroke press has an effective stroke of 7 in. and throat clearance from bed to ways of 21 in. The Model 10-M-32 is a deep-throated press designed for work where extra throat capacity is required.

INCLINABLE PRESSES—*E. W. Bliss Co., Toledo, Ohio.* Oil-impregnated bearing on the rolling-key clutch of Bliss inclinable presses needs to be oiled only after each 40-hr operation. Bearings have an outer peripheral groove which serves as a reservoir.

PUNCH PRESS—*Diamond Machine Tool Co., 3425 E. Olympic Blvd., Los Angeles 23, Calif.* This machine has a 13-in. throat and contains 12 punches and dies, which may be brought under the ram by a twirl of the index handle.

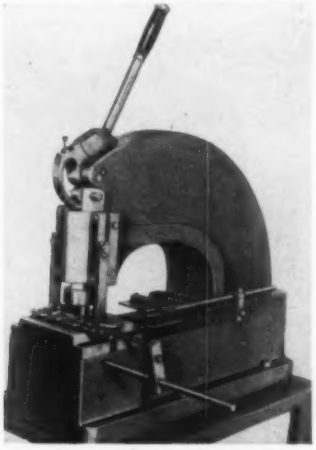
OVERLOAD DEVICE—*Clearing Machine Corp., 4699 W. 65th St., Chicago 38, Ill.* An overload safety unit called Loadtrol is applied to the bottom end of each tie rod of Clearing presses. The unit makes it possible to preload the tie rods cold in a matter of minutes.

ELECTRIC HAMMER — *Black and Webster Inc., 30 Pleasant St., Needham 92, Mass.* Known as the Electro-press, this electric impact hammer delivers an impact up to 6000 lb, and then follows through with a squeeze of 2000 lb at the end of the stroke.

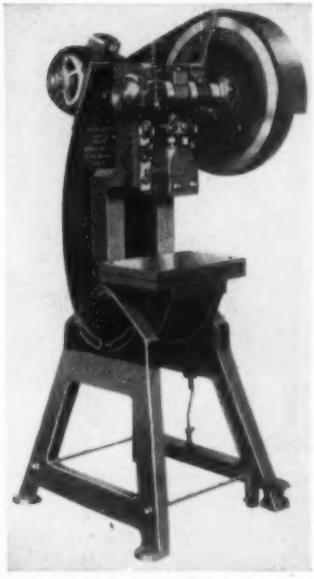
SPRING SAFEGUARD — *Central Safety Equipment Co., Philadelphia 25, Pa.* The Elasticone entirely incloses the pin and bushing area of punch presses, eliminating the pinch point and protecting operators.

PRESS UNLOADER — *Sahlin Engineering Co., 267 Ferndale St., Birmingham, Mich.* The Iron Hand, built to automatically unload stamping presses, has been redesigned to have a longer stroke and a longer reach.

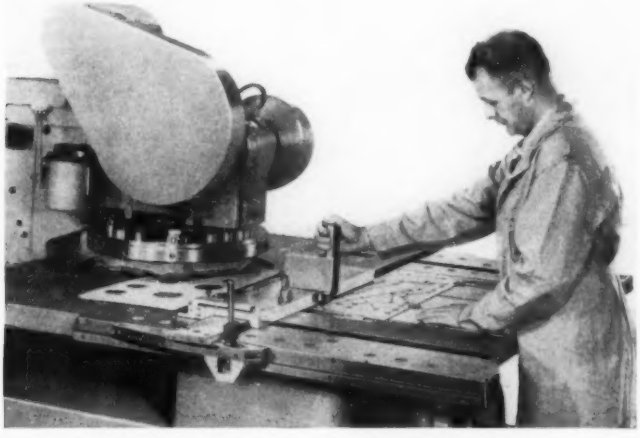
ONE-POINT PRESSES—*E. W. Bliss Co., Toledo 7, Ohio.* The main drive unit of these inclosed one-point presses has been lowered and the clutch and flywheel assemblies are outside the crown, reducing the required headroom for the unit.



BENCH PUNCH—*O'Neil-Irwin Mfg. Co., Lake City, Minn.* Di-Arco No. 2 perforates holes of various shapes and sizes as large as 4-in. dia. and can be used as a precision punch press. A 12-in. throat allows working to centers of sheets 24-in. wide.



INCLINABLE PRESS—*Sales Service Machine Tool Co., 2363 University Ave., St. Paul 4, Minn.* This positive, single-stroke press has a sliding-key clutch with a four-point engagement ring, and a roller-bearing-mounted flywheel.



PUNCH PRESS — *Wiedemann Machine Co., Dept. 17, 4272 Wissahickon Ave., Philadelphia 32, Pa.* The pantograph for rapid hole location, and a turret for quick access to punches and dies are combined in the RA-41P punch press for high-speed piercing.

ARBOR PRESS—*H. D. Herder, 2723 E. Michigan Ave., Kalamazoo, Mich.* The Model HP-600 provides 800 lb of pressure and the controls necessary for pressing small shafts, gears, wheels and bushings.

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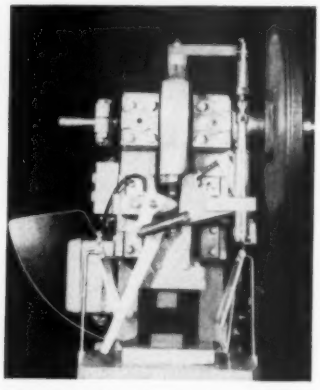
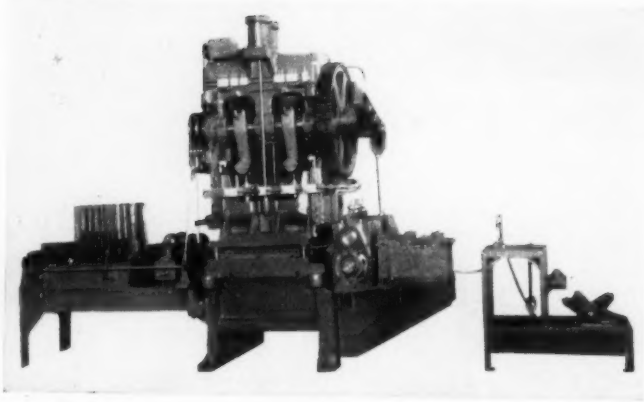
1-TON PRESS — *Benchmaster Mfg. Co., 2952 W. Pico Blvd., Los Angeles 6, Calif.* A motor unit equipped with a belt-tension stop on this midget press takes the weight load of both motor and bracket off the V-belt, increasing the life of the motor and flywheel bearings.



PRESS GUARD — *Jamestown Safety Guard Corp., 170 Hopkins Ave., Jamestown, N. Y.* Anderson safety guards are made to fit each individual machine and are available for presses with strokes from 1 to 6 in. inclusive. For normal operation the operator controls the closing of the guard with a pedal.



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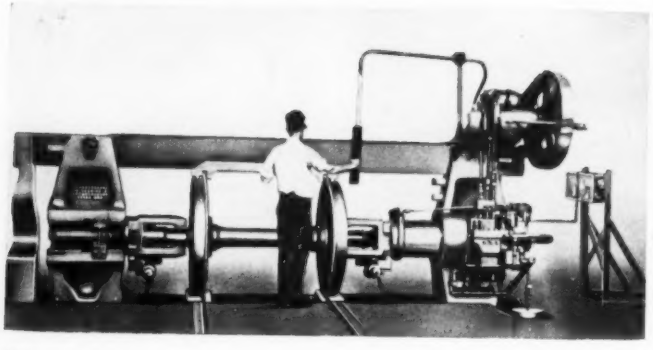
GAP PRESS—*The Cleveland Punch and Shear Works Co., Cleveland 14, Ohio.* This assembly-line setup includes a Cleveland 40G-36 double-crank gap press, uncoiler, roll feed, and stacker used in the production of radiator fins. The press is single-geared and equipped with a single-station electrically controlled drum air-friction clutch.

PRESS—*Sales Service Machine Tool Company, 2363 University Avenue, St. Paul, Minn.* Model 85 Press-Rite power press embodies a heavy-duty, bar-reinforced frame of semi-steel construction. The bars are said to provide a safety factor much higher than the rated capacity of 85 tons.



TOGGLE PRESS — *The Cleveland Punch and Shear Works Co., Cleveland 14, Ohio.* Straight-sided double-crank press, designated Cleveland 2T-96-400, is equipped with a single-station electrically controlled, air-operated friction clutch with spring-loaded brake. Capacity is 400 tons for inner slide and 250 tons for blankholder slide.

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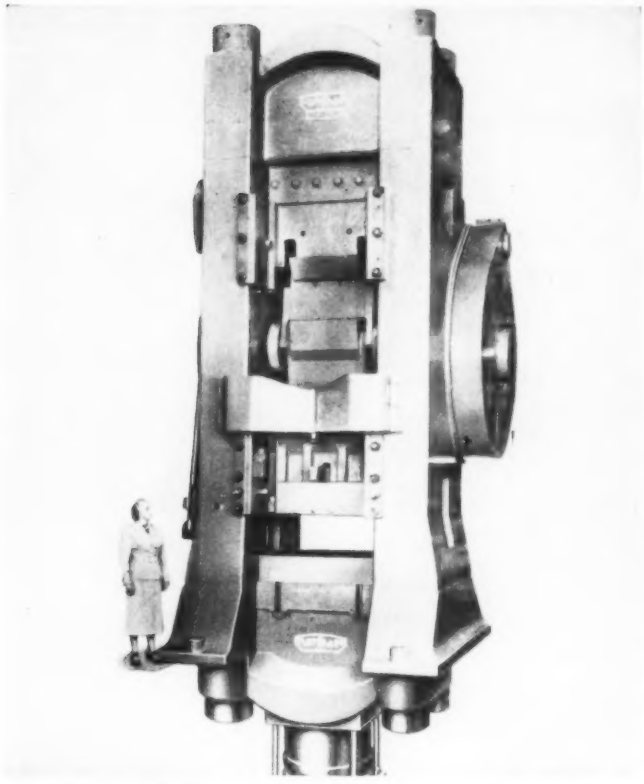
MOUNTING PRESS—*Chambersburg Engineering Co., Chambersburg, Pa.* Press for mounting car wheels features pushbutton controls by means of which all operations can be handled by a single operator.



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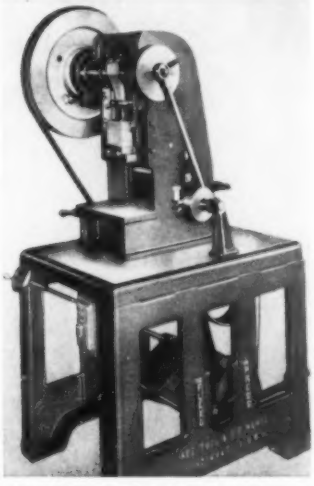
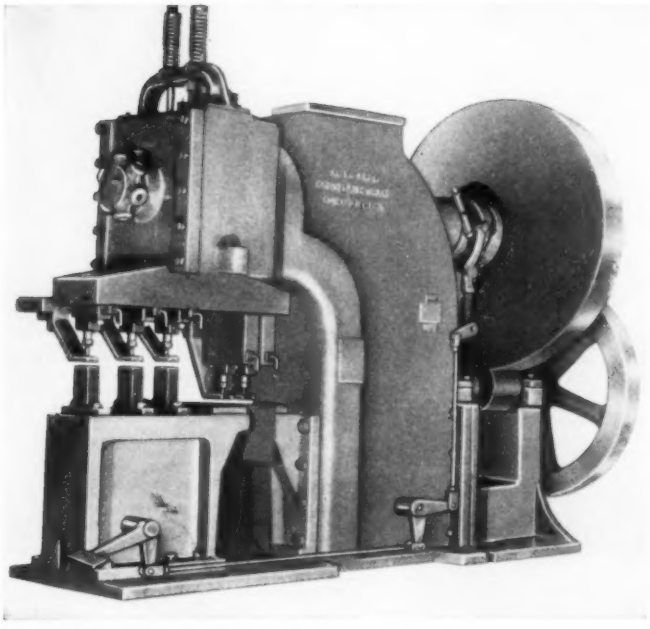
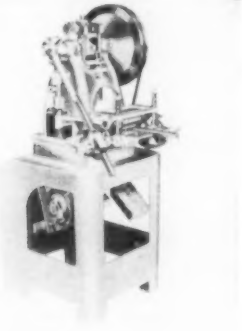
KNUCKLE-JOINT PRESS — *The Cleveland Punch & Shear Co., Cleveland, Ohio.* This knuckle-joint press with a capacity of 2500 tons is equipped with an air friction clutch and a bar knockout in the slide.



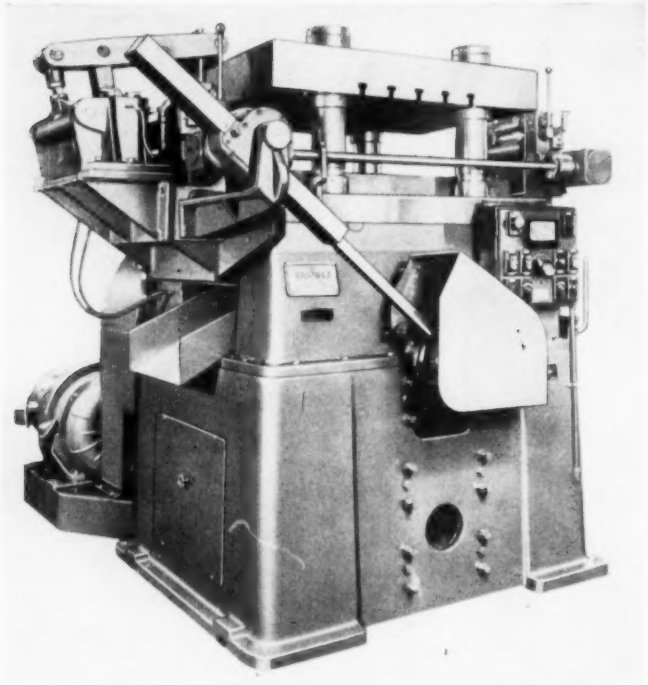
AUTOMATIC PRESS—*Ace Tool & Die Works, 129 E. McMicken Ave., Cincinnati 10, Ohio.* Rated at 12 tons, the Flex-O-Press handles material up to 9-in. wide and provides production rates of from 9000 to 36,000 pieces per hour. The feed rolls are located close to the die.





5-TON PRESS—*Di Machine Corp., 2711 W. Irving Park Road, Chicago 18, Ill.* Redesigned 5-ton automatic press. The base encloses the motor, belt, and pulley for sturdier, more modern appearance and safer operation.

←
PUNCH — *Kling Bros. Engineering Works, 1300 No. Kostner Ave., Chicago 51, Ill.* For use in structural steel and fabricating shops, the No. 12 universal punch has rated ram pressure of 235 tons, a 2½-in. stroke, and a throat depth of 28½ in. It can punch a 2½-in. hole through 1¼-in. mild steel.



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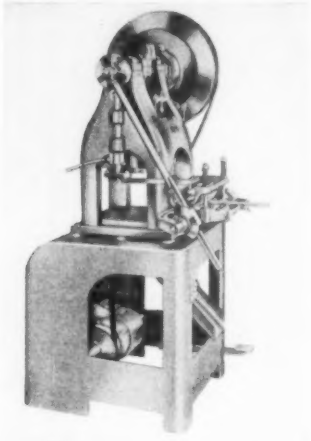
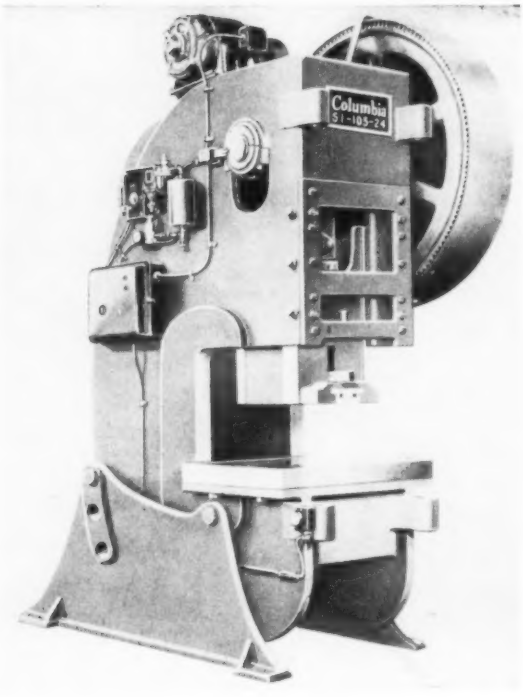
AUTOMATIC PRESS—*Brandes Press Co., Dept. A, 6408 Euclid Ave., Cleveland 13, Ohio.* A line of wide-bed automatic presses, ranging in size from 30 to 2500 tons, has been built. New features include T-slots in the top platen and remote control of the variable-speed drive.



AUTOMATIC PRESS — *Di Machine Corp., 2711 W. Irving Park Rd., Chicago 18, Ill.* With an 8-ton rating, it features a cylinder-type ram which slides in an adjustable bronze sleeve.



5-TON PRESS—*Sales Service Machine Tool Co., 2363 University Ave., St. Paul, Minn.* The Model "O" press is available with anti-friction roller bearings in the flywheel, a cam-actuated brake, a new type of connecting rod, and a non-repeating safety mechanism.

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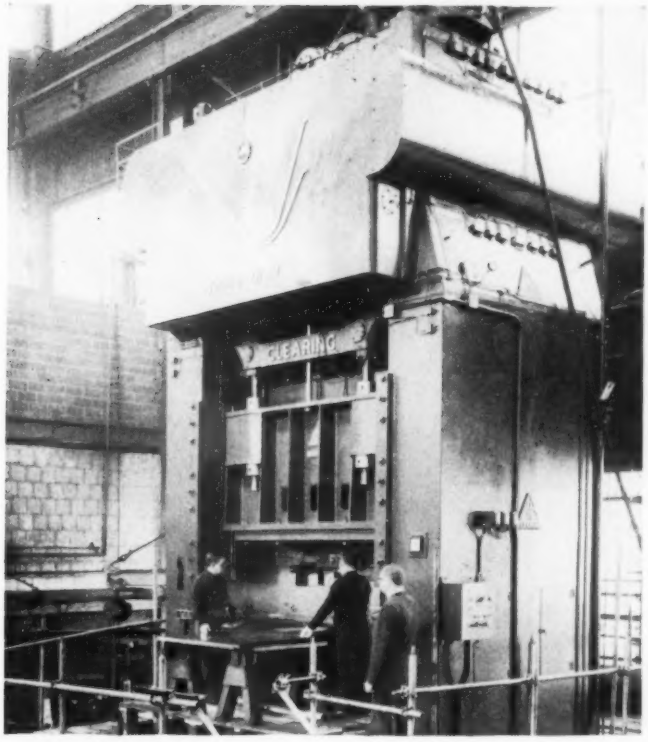
PRESSES—*Columbia Machinery and Engineering Corp., Hamilton, Ohio.* A complete line of single-crank open-back inclinable and gap presses. The larger sizes use an aluminum cone clutch which is said to be greatly reduced in size and weight and to produce a correspondingly large reduction in flywheel effect.



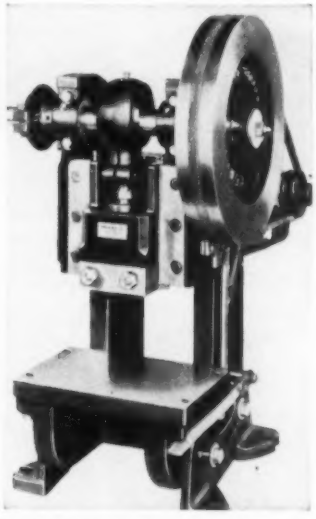
HIGH-SPEED PRESS—*Clearing Machine Corp., 6499 West 65th St., Chicago 38, Ill.* A gain of 70% in productive speed is claimed for HiProDraw presses. A mechanical, double-action press, it has a changed linkage arrangement so that the inner slide moves much more rapidly during the non-drawing parts of its cycle.

PRESS—*Benchmaster Mfg. Co., 2952 West Pico Blvd., Los Angeles 6, Calif.* To cover the widest possible range of press uses, the shut height of this 7½-ton punch press (ram up, to bed) has been increased to 9 in.

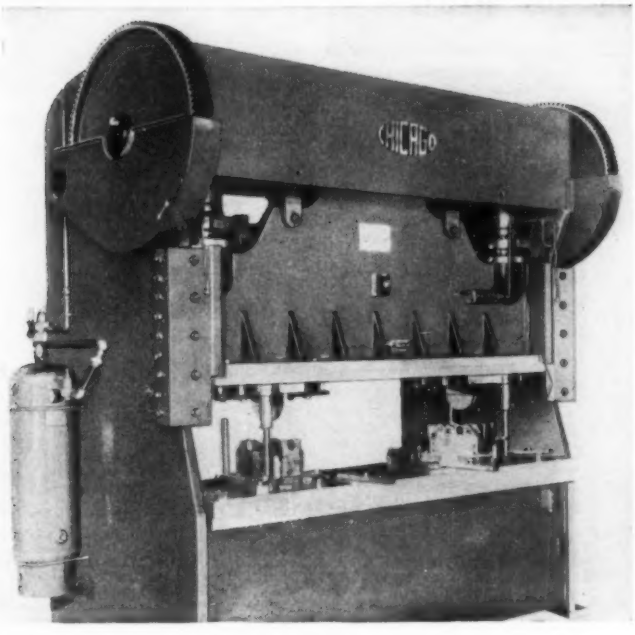
FRICTION ROLL FEEDS — *Benchmaster Mfg. Co., 2952 West Pico Blvd., Los Angeles 6, Calif.* Expanded line of four automatic friction roll feeds will handle stock in widths of 3, 5, 7, and 9 in, with an adjustable stroke of from 0 to 3 in.

PRESS CLUTCH BRAKE—*Industrial Clutch Corp., Waukesha, Wis.* Friction clutch brake for punch presses, power shears, and start-stop operations in general is operated by air at shop-line pressures, through an electric solenoid valve provided with a pushbutton.

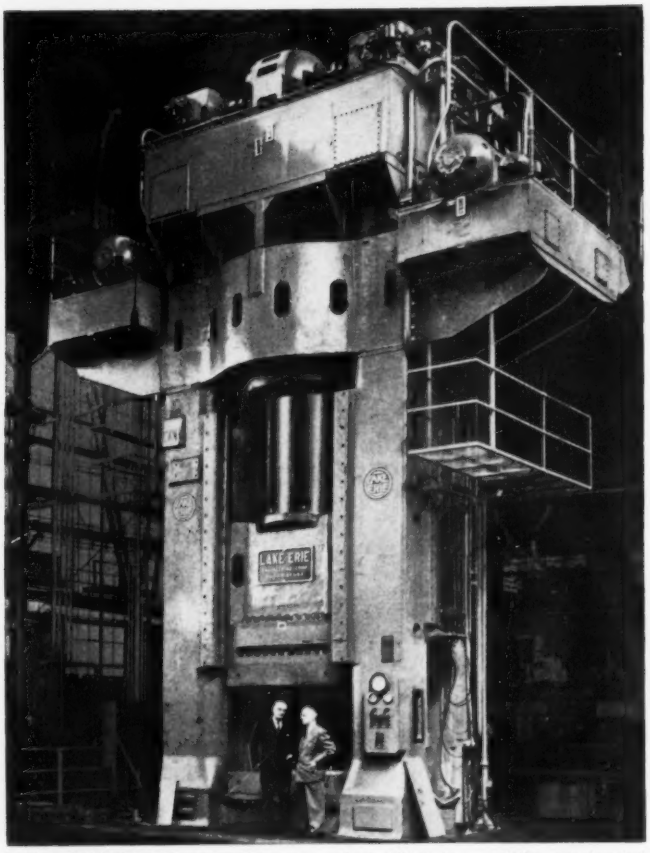
PRESS—*The E. Y. Ferner Co. Inc., Boston 48, Mass.* Press, utilizing a strong electromagnet, is claimed to replace many manual-operated screw presses.



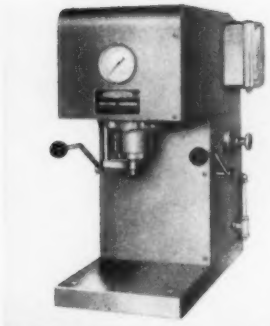
PUNCH PRESS—*Kenco Mfg. Co., 5211 Telegraph Rd., Los Angeles 22, Cal.* 4-ton inclinable bench-model punch press has a positive, single-trip mechanism, adjustable for wear, and instantly convertible from single-trip to repeat without stopping the motor.



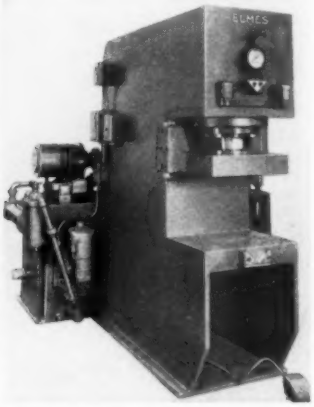
STRAIGHT-SIDE PRESS — *Dreis & Krump Mfg. Co., 74th St. and Loomis Blvd., Chicago.* In this adaptation, standard press-brake parts and controls are used wherever possible at a saving in cost. A wide-bed arrangement will hold the ram in perfect alignment under off-center loading or concentrated loading.



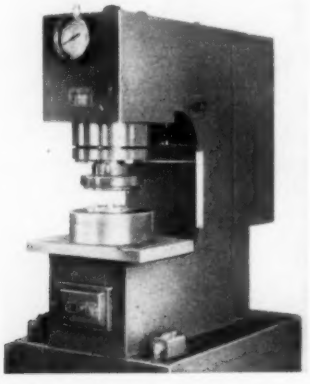
COLD EXTRUSION—*Lake Erie Engineering Co., Woodward Ave., Buffalo 17, N. Y.* By concentrating as high as 100 tons per square inch pressure on a steel billet in specially constructed dies, this press causes the cold steel to flow around a mandrel.



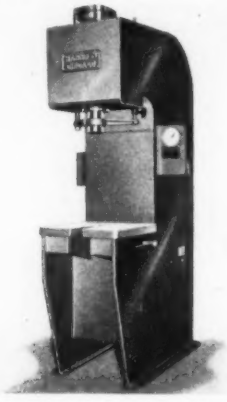
BENCH PRESS—*Hannifin Corp., 1118 So. Kilbourn Ave., Chicago 24, Ill.* Hydraulic "Han-D-Press" is available as the F-10 (1-ton) or as the F-20 (2-ton). Dual, tamper-proof, mechanical controls are standard.



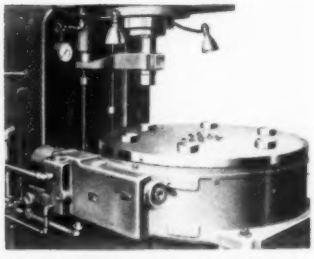
OPEN-SIDE PRESS—*American Steel Foundries, Elmes Engineering Div., Cincinnati 29, O.* Operating at 35 cycles per min, this hydraulic press shears, rivets, and straightens forged-steel parts on each cycle. Photo-electric safety control stops platen if obstruction breaks light beam at entrance to dies.



PRESS—*M. & N. Machine Tool Works, Inc., 299 Allwood Road, Clifton, N. J.* This C-frame hydraulic press features automatic reversal at pressure setting, dual speeds, rapid advance, and slow pressing speed at full load.



FORCING PRESS — *Hannifin Corp., 1118 S. Kilbourn Ave., Chicago 24, Ill.* Low cost is said to result from a simplified design for 10-ton hydraulic forcing presses. Known as the F-101, the press is floor-mounted, with an 18- by 20-in. table, 36 in. above the floor.

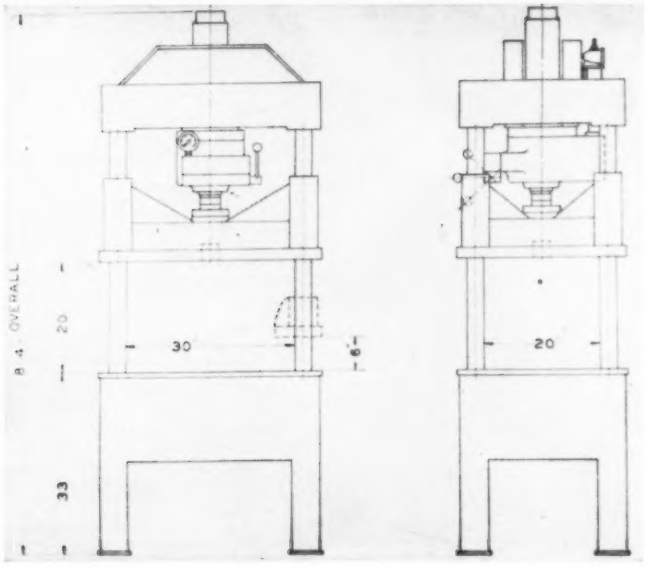


INDEX TABLE—*The Denison Engineering Co., 116 Dublin Road, Columbus 16, Ohio.* Hydraulically powered 33-in. automatic index table has 24-in. work circle and provides variable speeds for any pre-selected indexing rate from 10 to 70 indexes per minute.

PRESS — *Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.* Whereas the conventional mechanical press uses an eccentric stroke equal to the press stroke, in the Twin-Power it is less than half, and is applied only to the lower or work part. The approach part of the stroke is made independently of the eccentric by means of fluid action.

DRAWING PRESS—*Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.* Mass production of heavy-gage steel parts is said to be possible with this 750/500-ton press. The press is equipped with a 250-ton blank holder and a 200-ton hydraulic die cushion. Press has a 36-in. stroke.

FORMING PRESS — *The Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.* This 7000-ton press uses the Guerin process. A rubber pad acts as a pressing medium, forcing the metal against the die blocks.

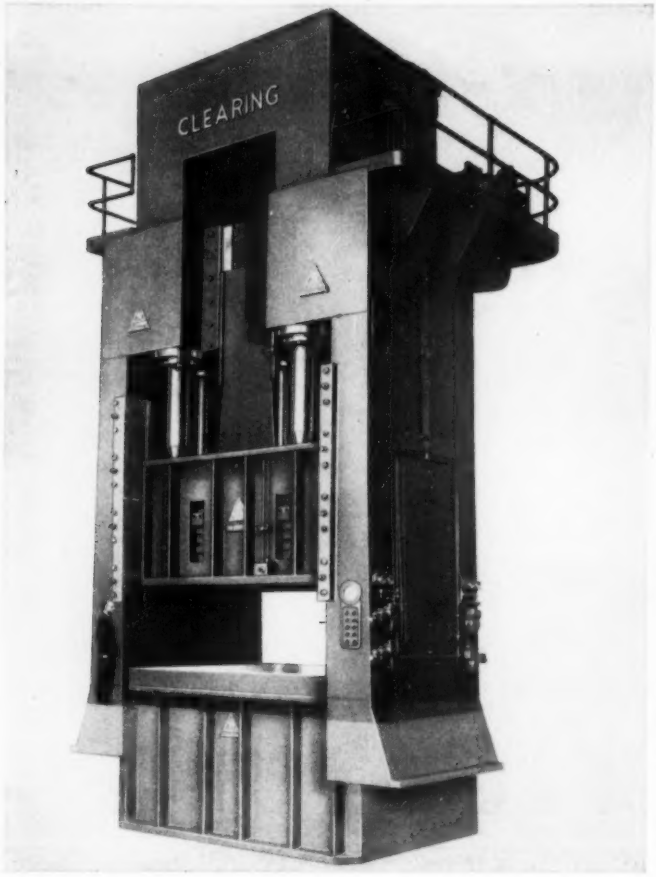


5-TON PRESS — *The C. R. Brandt Machine Co., Inc., York, Pa.* The self-contained pressure unit of this hydraulic press is quickly removable from the frame. A relief valve prevents overloading, pressure gage is optional, and the pressure unit can be used in vertical or horizontal position.

HYDRAULIC PRESS — *Beatty Machine & Mfg. Co., Hammond, Ind.* Shapes and cures liners for automatic washers. A single electric control provides rapid approach to a preset slowdown position, slow or pressing speed to dwell position, dwell for curing, and rapid return to up position.

METALLURGICAL PRESS—*Buehler Ltd., 165 W. Wacker Drive, Chicago 1, Ill.* A premold assembly complete with heating compartment and ejector levers is one of the features of this AB press.

DIE-TRYOUT PRESS—*Drake Engine Co., Grand Haven, Mich.* In power advance, ram moves 3 ipm, exerting 50 tons pressure. On return stroke the ram is capable of a 10-ton pull. It can be operated wherever an air supply is available and is made with either of two style pumps: one provides rated tonnage at 90 psi, and the other at 145 psi.



HYDRAULIC PRESSES — *Clearing Machine Corp., Chicago, Ill.* A line of heavy double-action presses have two independent hydraulic circuits, one for the blankholder slide, and the other for the punch slide, each with its separate pump. This stops losses in blankholder pressure during the stroke.

HYDRAULIC PRESSES—*Bunell Machine and Tool Co., 1601 E. 23rd St., Cleveland 14, Ohio.* An extremely flexible design is combined with low original and operating costs in this press. Individual specifications on die space, die opening, stroke, pressure, and number of hydraulic cylinders can easily be met.

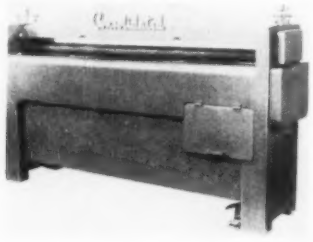
STRAIGHTENING PRESS — *R. D. Wood Co., Philadelphia 5, Pa.* A 100-ton hydraulic press used for straightening operations on tubes, shafts, bars and similar pieces has a 13-in.-diameter main ram with a 12-in. stroke.

FORCING PRESS — *Hannifin Corp., 1118 S. Kilbourn Ave., Chicago 24, Ill.* Hydraulic forcing press is used primarily for press-fit assembly of shafts to armatures and rotors. This 150-ton, 4-post unit offers a maximum of 275-ipm ram speed, has an 82-in. gap, ram up, and a 48-in. max. stroke.

ASSEMBLY PRESS—*Colonial Broach Co., Detroit, Mich.* For a cylinder-head production line, it has a 15-ton capacity. A 3-station machine, it presses valve guides into place, four at a time. The six-step cycle includes automatic location of the cylinder head.

LEAD-EXTRUSION PRESS — *John Robertson Co., Inc., 121 Water St., Brooklyn 1, N. Y.* Self-contained oil-hydraulic lead-extrusion press is for use by cable and rubber-hose manufacturers.

BRIQUETTING PRESSES—*Spo Inc., 6430 Grand Division Ave., Cleveland 5, Ohio.* Presses for converting low-grade bulk-metal turnings, boring, chips, and shavings into cylindrical metal blocks that are suitable for charging directly into a foundry cupola.



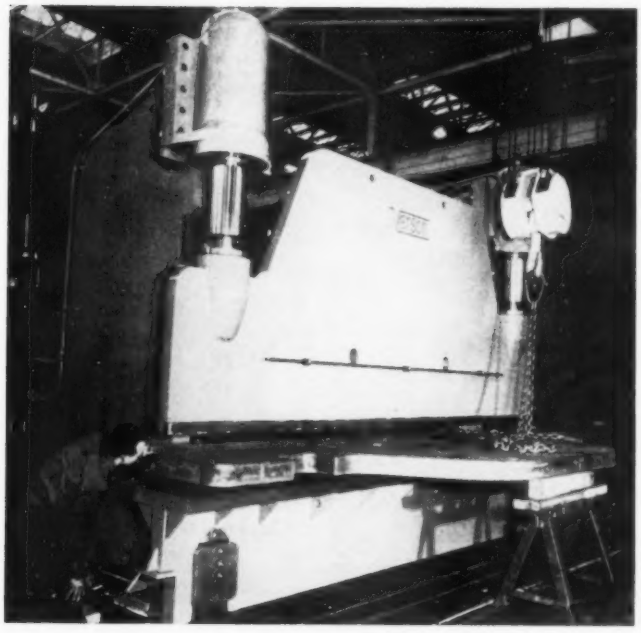
STRAIGHTENING MACHINE—*Consolidated Equipment Co., 2155 W. Wabansig, Chicago 47, Ill.* For straightening, rolling, or form rolling of sheet stainless steel, aluminum, zinc, copper, cold-rolled and hot-rolled steel, and similar metals.

HYDRAULIC PRESS—*Hy-Air Products Co., Jackson, Mich.* Automatic cycling is built into this oil-hydraulic press in the form of an 8-station air-operated automatic dial-index table. Tables can be furnished with 4, 6, 8, 12, or 24 positions, with or without complete tooling.

NOTCHER—*J. F. Kidder Mfg. Co. Inc., 368 Colchester Ave., Burlington, Vt.* This Little Blacksmith notcher can be foot operated or can be air operated by attaching a cylinder.

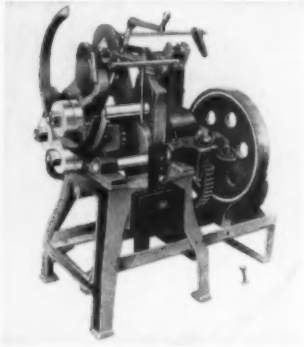
◄—

HYDRAULIC PRESS—*The Denison Engineering Co., Columbus, Ohio.* The 50-ton Multipress has a 15-in. stroke, 24-in. daylight opening, and a work surface of 31x19½ in., all of which provide more die space.

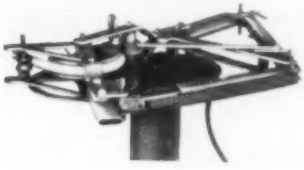


BENDING PRESS — *The Cleveland Crane and Engineering Co., Wickliffe, Ohio.* Of 300-ton capacity, it blanks out clutch rings and clutch-gear teeth at 25 strokes per min. Shut height is 14 in. and throat depth is 18 in.

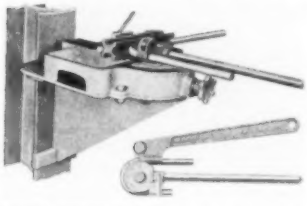
PRESS BRAKES — *Verson Allsteel Press Co., 9316 S. Kenwood Ave., Chicago 19, Ill.* Press brakes said to bring the advantages of hydraulic operation to heavy plate work. They cannot be overloaded and are said to be safely used for bottoming work.



BENDING MACHINES — *Excelsior Tool & Machine Co., East St. Louis, Ill.* This reversible circular bender will roll part or complete circles on angles, flats, pipes, rounds, and other cross-sections.

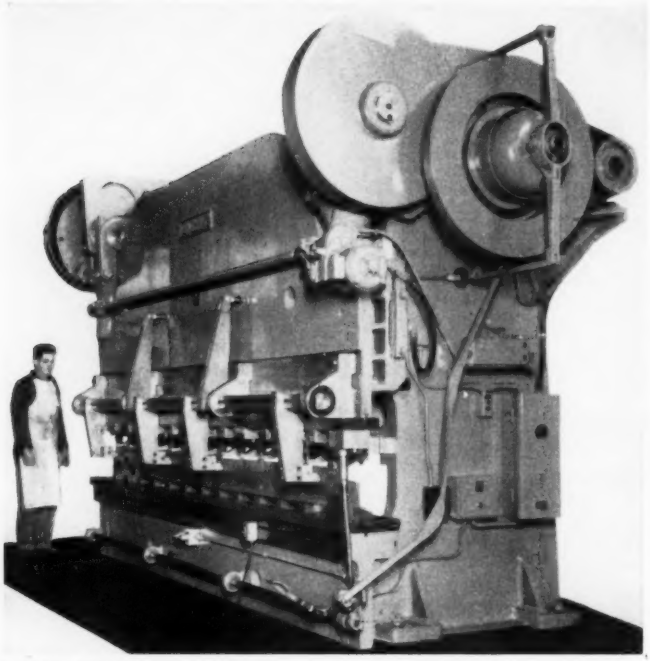


BENDING UNIT—*Hossfeld Manufacturing Co., Winona, Minn.* A hydraulic unit consisting of motor, pump, cylinder, and foot control has been added to the No. 2 hand-operated bender. Stock such as 2x2x3/16-in. angle iron and 2-in. pipe are easily bent.

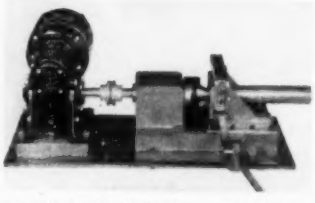


TUBE BENDERS—*Republic Mfg. Co., 1930 W. 77th St., Cleveland 2, Ohio.* Three models of the Republic tube bender cover a range of ¼ to 1¼ in. The bench units range from ⅜ to 1½ in. and may be post, bench or stand mounted. Hand benders No. 38 and 39 cover ranges of ¼ to ½ and ⅝ to ¾ in. respectively.

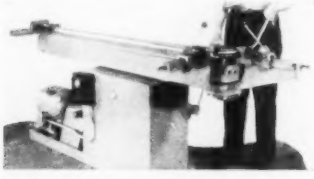
BENDING PRESS—*Cleveland Crane and Engineering Co., Wickliffe, Ohio.* Steelweld bending press Model MO6-12 has a bending capacity of 500 tons, and will bend up to ⅝-in. plate 20-ft 6-in. long. Will take a large gooseneck punch, and for this reason has a shut height of 30 in.



PRESS BRAKE — *The Cincinnati Shaper Co., Hopple, Garrard & Elam St., Cincinnati, Ohio.* A multiple-punching setup that eliminates layouts and is said to result in great saving in punching time on support angle, support channels, side angles, and similar pieces. The press brake is set up, the work is placed, and all holes in a side are punched at one time.



FLARING-MACHINE—*Cox Engineering & Sales Co., 2046 E. Grand Blvd., Detroit 11, Mich.* Process can be applied to steel or copper tubing, and dies are available to accommodate ⅝-, ¾-, ⅞-, 1⅛-, and 1⅛-in. tubing, with 30°, 37°, or 45° angle fittings, and other angles upon request.

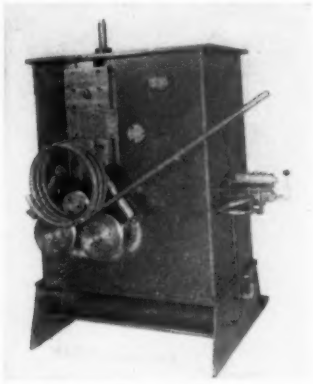


BENDER — *Pines Engineering Co., Inc., Aurora, Ill.* Simple hydraulic operation of the bending movement of the Series 1400 bender is initiated from a hand lever which responds to 2-in. movement in either direction to bend or return arm.

POWER BENDER—*O'Neil-Irwin Mfg. Co., 237 Eighth Ave., Lake City, Minn.* An automatic angle control facilitates a series of progressive bends at varying degrees in a single part without removing the piece from the machine. Multiple-length gage is provided for duplicating identical parts.

ROLL-FORMERS — *American Roller Die Corp., Cleveland 17, Ohio.* Built in standard sizes to take 20-gage material up to 5 in. wide, the Type H roll-forming machines form, curve, emboss, and cut in one continuous operation.

BAR BENDER—*Wm. K. Stamets Co., Pittsburgh 22, Pa.* The No. 2 machine is capable of bending bars up to and including ⅞-in. diameter. The arms are adjustable and will make bends to a minimum center distance of 7⅜ in.



TUBE ROLLER — *Wallace Supplies Mfg. Co., 1300 Diversey Parkway, Chicago.* Operated by hydraulic control valve—no manual operation is necessary after initial setup.

TUBE-BENDING PRESS — *The Gibbons Machine Co., Tipp City, Ohio.* The problem of varying degrees of bend at a particular station of a multiple-index stop is said to have been eliminated by the stop used in this press.

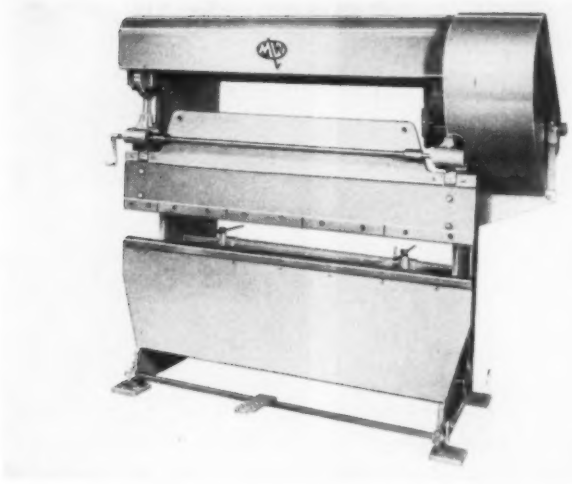
TANGENT BENDER—*The Cyril Bath Company, 6910 Machinery Ave., Cleveland 3, Ohio.* Metal cabinets can be formed in one piece on this tangent bender, at rates up to 400 bends per hour. It is known as an open-throat single-wing tangent bender.

STRAIGHTENING PRESS — *Lempco Products, Inc., Bedford, Ohio.* Said to combine the advantages of both electric and hydraulic drives for riveting, straightening, and pressing, this 150-ton press is equipped with finger-tip control which quickly runs the ram down to the work and builds up pressure rapidly to a pre-selected tonnage.

WIRE STRAIGHTENER — *American Pullmax Co. Inc., 2627 North Western Ave., Chicago 47, Ill.* A wire-straightening machine, called the TM-6, is entirely automatic; taking wire from a reel and feeding it into rotating straightening dies.

BENDING MACHINE—*Paul Machine Tool & Die Works, 4612 S. Kedzie Ave., Chicago 32, Ill.* Speed of the Bendix air-compression tubular bending machine is said to have been doubled through the development of an automatic clamp. Up to 900 bends can be made per hr on 1-in. 16-gage tubing.

ROTARY-FIXTURE MACHINE—*Pines Engineering Co., Inc., Aurora, Ill.* This machine will bend irregular shapes of true radii in tubing, bars, extrusions, or roll-formed sections up to 8-in. wide.

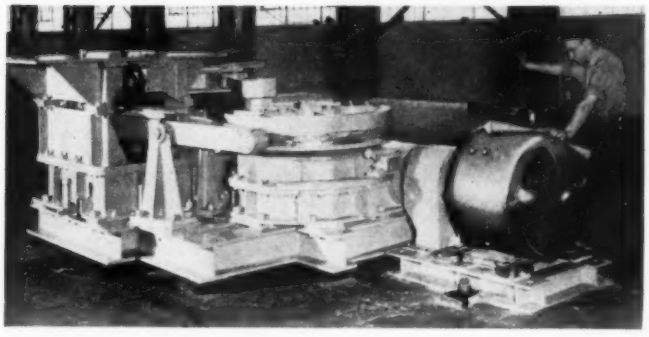


PRESS BRAKE—*Airtherm Mfg. Co., 763 South Spring Ave., St. Louis 10, Mo.* A line of press brakes called The Metal Worker have, among other features: all-steel welded frames; single-plate friction clutch integral with the flywheel.

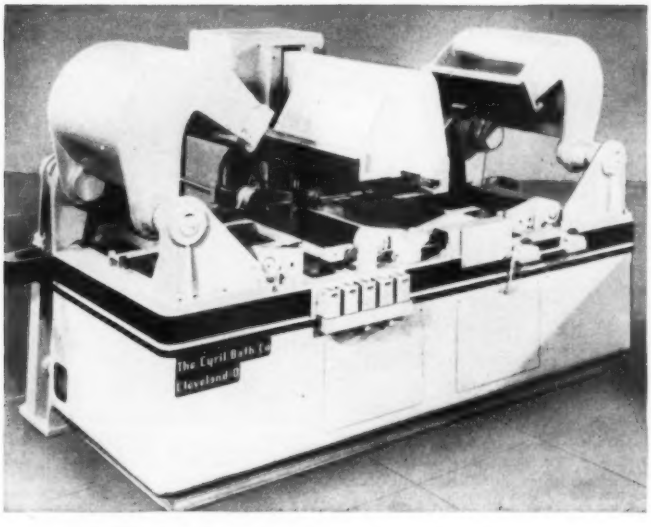
TUBE-BEADING MACHINE — *Gibbons Machine Co., Tipp City, Ohio.* Machine for beading tubing after it is bent has been developed using a spinning principle. Two electric motors, one 7½ and the other 10 hp, power the unit.

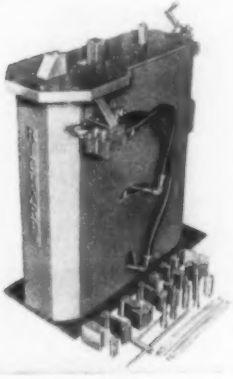
CONE-ROLLING MACHINE — *Reed Engineering Co., 1003-17 W. Fairview Ave., Carthage, Mo.* The Model R employs three conical-shaped rolls mounted in a cantilever design and is said to be able to produce shapes with almost a complete point on the small end.

TUBE BENDERS — *The Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago, Ill.* Gear-operated tube benders form thin-wall tubing in either individual sizes or in combination sizes. Full 180° bends and positioning at any point on the tubing without disassembly are claimed.



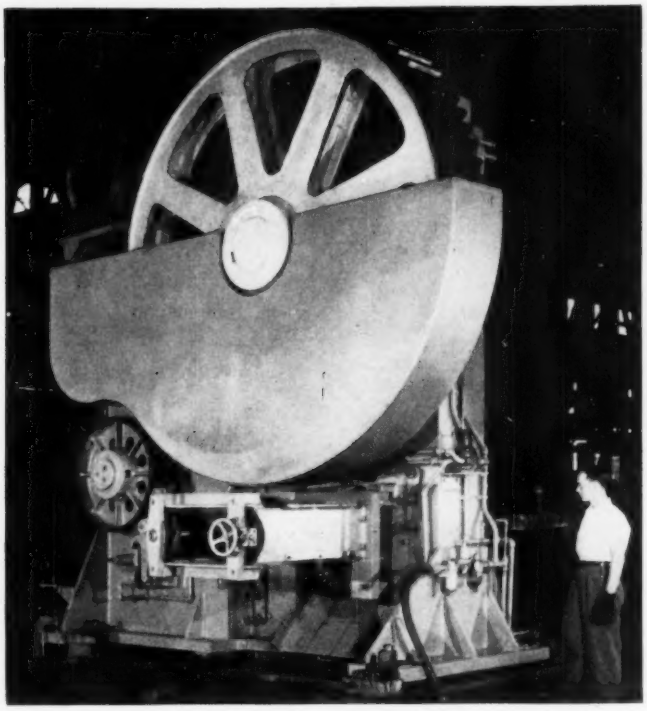
BAR-BENDER—*Bethlehem Steel Co., Bethlehem, Pa.* Straight steel bars are bent into accurately angled zig-zag shapes for use as continuous web members on this machine. Any desired length can be fed straight into the machine and are bent over adjustable dies by a roller.



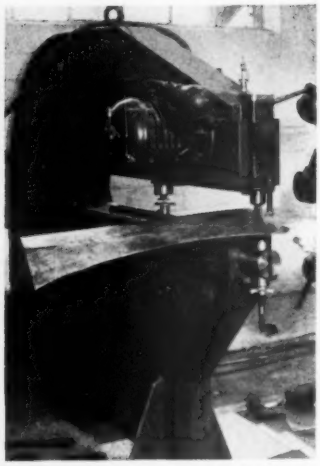


MULTIFORM BENDER—*J. A. Richards Co., Kalamazoo 60F, Mich.* Improved model of the Multiform bends heavier and wider steel, has more power, an improved toggle mechanism, and hardened insert bushings.

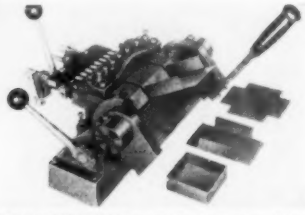
FOUR-WING TANGENT BENDER—*The Cyril Bath Co., Cleveland, Ohio.* Forms 125 washing-machine cases per hr. Blanked and punched sheets are fed end-wise into a clear space in the center of the machine. Series of 15 movements can be manually controlled but is normally automatic.



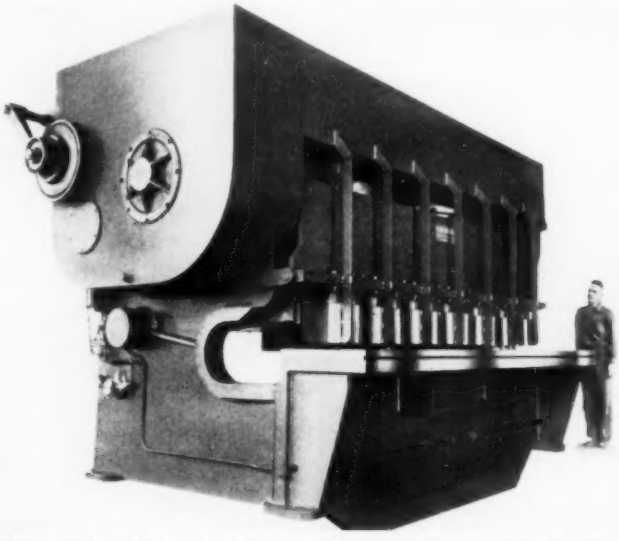
SHEAR—*Bethlehem Steel Co., Bethlehem, Pa.* Mild-steel billets up to 6 in. square, and 105,000-psi-tensile steel billets up to 4 in. can be cut with high accuracy in this shear. An air-cushioned gage facilitates positioning of work to within 0.008 in., while measuring slugs from 3 to 38 in. long.



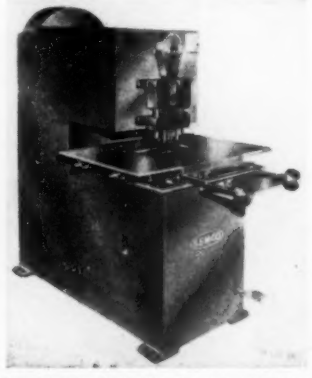
SHEAR—*Baker Bros., Inc., 1000 Post St., Toledo 10, Ohio.* Mild- or stainless-steel sheets to 3/16-in. thick can be cut on the Baker Tru-Edge Shear. Attachment for circle and strip cutting is provided and the shear may be used to cut to a scribed line or by templet.



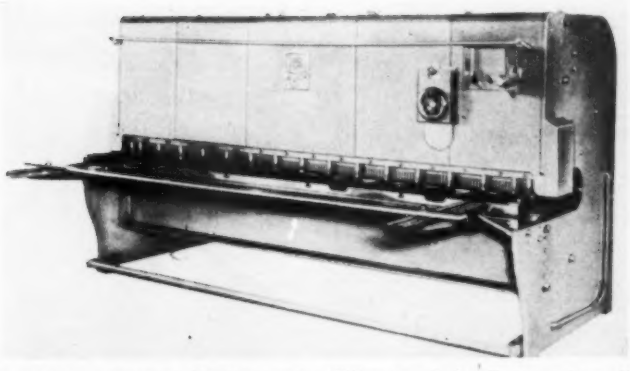
BOX FINGERS—*O'Neill-Irwin Mfg. Co., 311 Eighth Ave., Lake City, Minn.* All Di-Arco brakes, regardless of the date purchased, can be converted to precision box and pan brakes by replacing the standard solid-top bar with a box-finger bar.



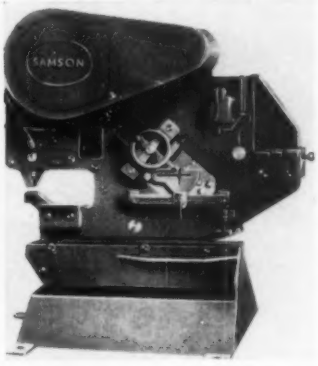
SHEAR—*The Cleveland Crane & Engineering Co., Wickliffe, Ohio.* Has a shearing capacity of 12 ft of 1-in. steel plate and cuts at rate of 25 strokes per min. A micro-speed knife adjustment facilitates quick change of knife clearance to suit varying plate thicknesses.



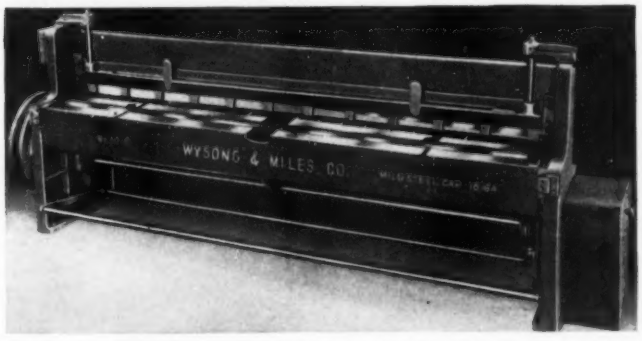
NIBBLER PRESS—*Service Machine Co., 226 Miller St., Elizabeth 4, N. J.* Two hundred and sixty strokes per minute instead of 210 speeds up hole-, slot-, or notch-punching speed of the Semco nibbler press by as much as 15%, according to manufacturers.



SHEARS — *Johnson Machine and Press Corp., Elkhart, Ind.* The Hydra-Shear, for sheet-metal squaring and slitting, uses hydraulic power to avoid overload.

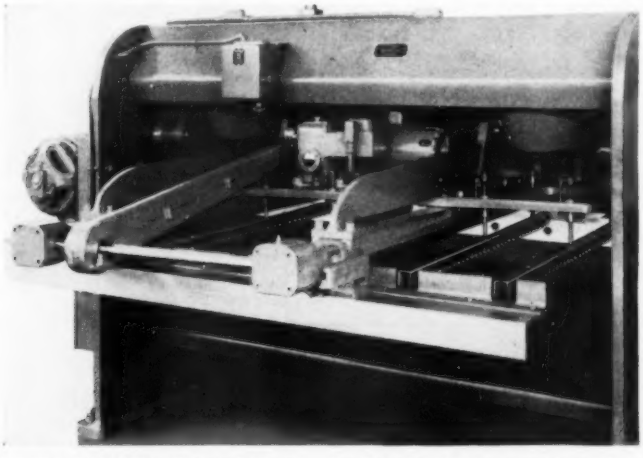


UNIVERSAL FABRICATOR—*Julius Blum & Co., Inc., 532-540 W. 22nd St., New York 11, N. Y.* The punch of the Samson No. 10 universal fabricator handles webs and flanges of beams, channels, and columns as well as angles and flat stock. Includes a shear, bar cutter, miter, coper, and two interchangeable die blocks.

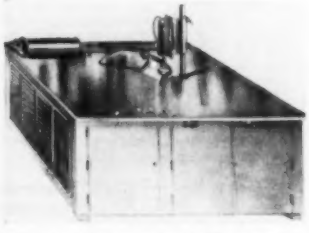


POWER C3 SHEARS—*Wysong and Miles Co., Greensboro, N. C.* Bed, end-frames, knife bar, hold-down, and top girder of this Wysong and Miles power squaring shear line are one-piece high-tensile castings containing more than 30% steel.

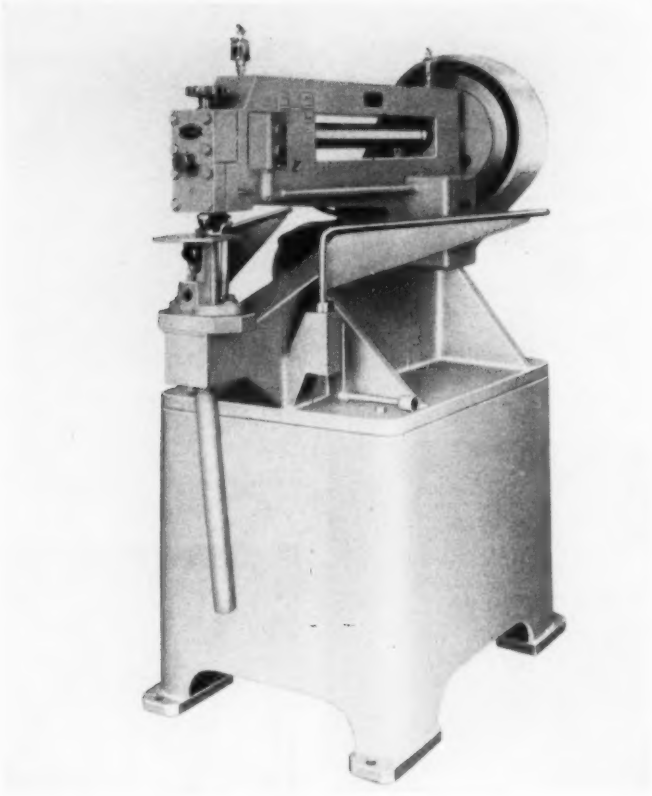
SHEET-METAL FABRICATOR — *Wales-Strippit Corp., North Tonawanda, N. Y.* Punches, notches, and nibbles sheets, angles, channels, and extrusions in up to ¼-in. mild steel. A foot switch permits freedom of both hands to handle work during operation.



SHEET SUPPORT—*Cincinnati Shaper Co., Hopple, Garrard & Elam Streets, Cincinnati, Ohio.* Permanent Alnico magnets are used to support the sheet so that it can be pushed back against the back angle for accurate gaging. A roller arrangement provides easy handling of the sheet when feeding the shear.



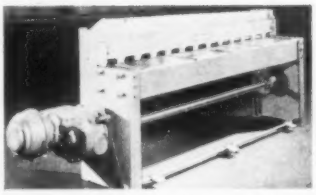
DRAWN-SHELL TRIMMER—*Dayton Rogers Mfg. Co., 2824 13th Ave. South, Minneapolis 7, Minn.* Model B machine will trim shells of practically any depth up to a maximum of 14 gage in thickness.



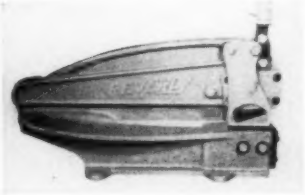
NIBBLING MACHINE — *Campbell Machine Div., American Chain & Cable Co., Inc., Bridgeport, Conn.* Nibbler has a variable stroke making it possible to set the length to compensate for ←thickness of metal being cut.

SPLITTING SHEARS — *Beverly Shear Mfg. Co., 3004 W. 111th St., Chicago 43, Ill.* SS-Series slitting shears, handle 14-gage, 10-gage, and 3/16-in. mild steel, with minimum size and weight.

DROP STAMP — *The Chambersburg Engineering Corp., Chambersburg, Pa.* The Cecostamp uses impact blows of controlled intensities to produce a wide variety of metal shapes. Said to be 10% more powerful than preceding units the Model L incorporates several new safety features.

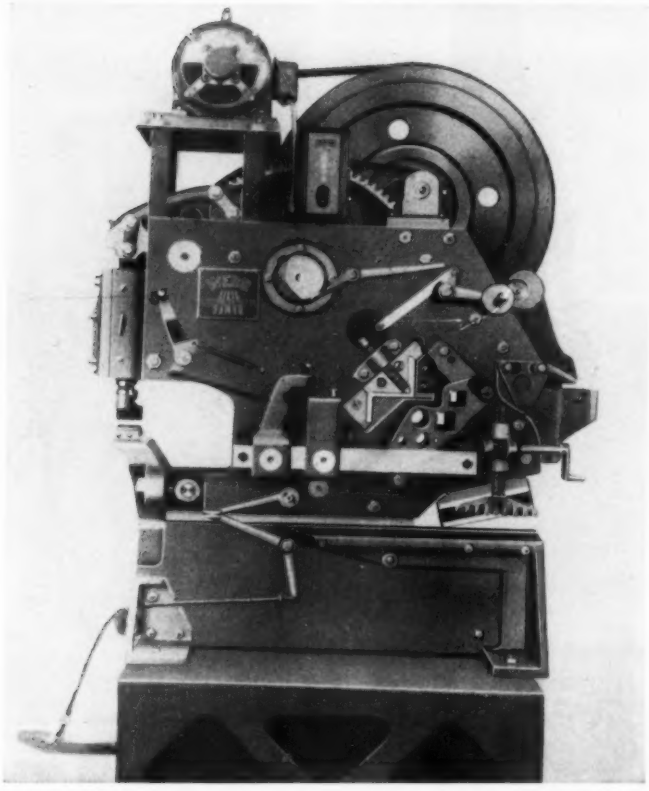


POWER SHEARS—*Niagara Machine & Tool Works, 637-697 Northland, Buffalo 11, N. Y.* Downtime lost while waiting for dull knives to be reground is cut to a minimum on the Series 1 shears by use of four cutting-edge knives instead of the customery one.

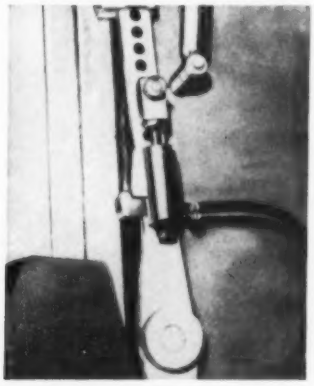


INSIDE SLOTTER — *Beverly Shear Mfg. Co., 3004 W. 111th, Chicago 43, Ill.* Designed for fast cutting and slotting up to 8 in. in size, this deep-throat inside slotter handles metals up to and including 16 gage.

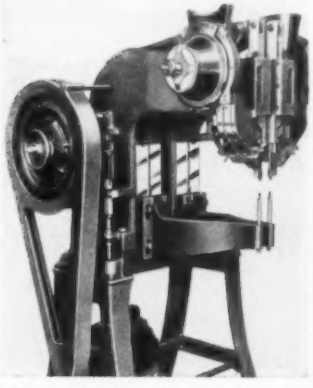
SHEAR LINE—*E. W. Bliss Co., Toledo, Ohio.* For moderate production in mills, warehouses, and fabricating plants. Flattens and cuts coil stock to any length at approximately 300 ft per min. The upcut shear has a solid one-piece frame and is operated through an air clutch with built-in flywheel and integral brake.



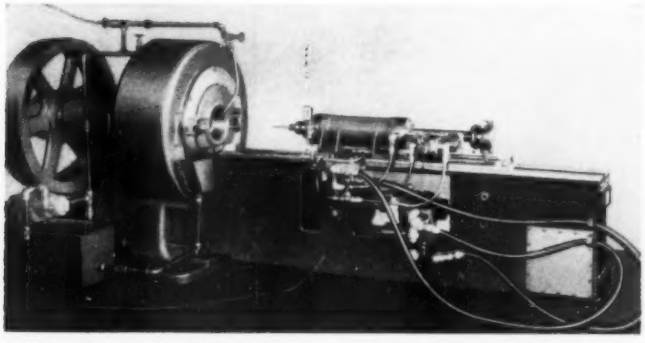
PUNCHING MACHINE — *The Webb Corp., Webb City, Mo.* At one end of the Steelworker is a punch, and at the other end a shear with a shearing capacity of ½-in. plate. The machine also contains a section cutter for cutting angles, T's, or Z sections.



AIR-OPERATED DOG — *Chambersburg Engineering Co., Chambersburg, Pa.* The ability to change from full stroke to short stroke or vice versa is provided in Chambersburg hammers, of 1000 lb and up. An air-operated dog attaches to the rocker which in turn controls the action of the valve.



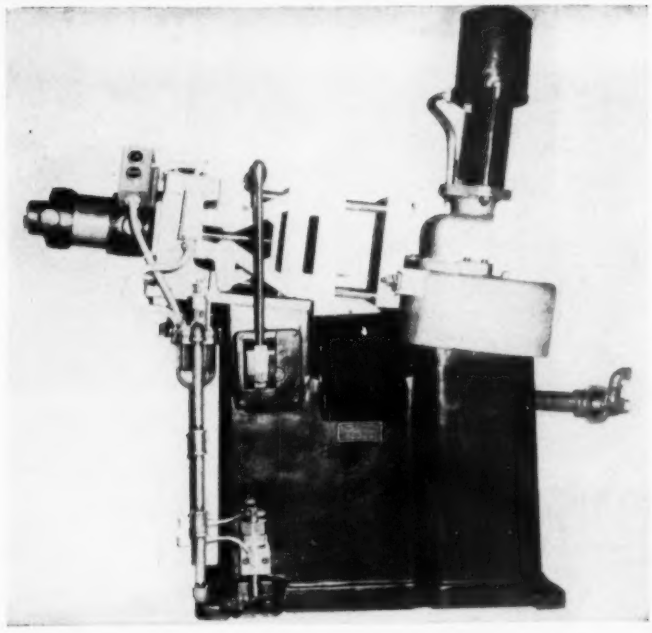
RIVET SETTER—*Chicago Rivet and Machine Co., Bellwood, Ill.* Model 214 has a 14-in. stroke and will set 9/64-in. steel tubular rivets in lengths up to ⅝ in. Has riveting centers adjustable from ⅜ to 7 in.



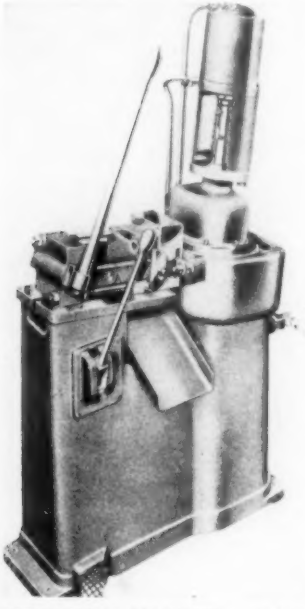
SWAGER—*Fenn Manufacturing Co., Hartford Conn.* The No. 6½ swager has the blanks fed in hydraulically. Work is automatically chucked as feed advances, automatically released on return. Dies are oil cooled from front and back.

DRILLER-RIVETER — *General Riveters, Inc., 785 Hertel Ave., Buffalo 1, N. Y.* This machine is an advanced design of the Model G 39A Drivmatic. It drills, countersinks, feeds, and heads a rivet. All four steps are performed in a continuous automatic cycle.

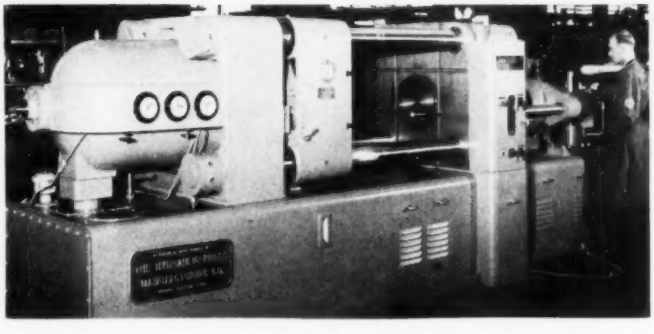
NAIL MACHINE—*Black Nail Machine Div., The Ohio Electric Mfg. Co., 5900 Maurice Ave., Cleveland 4, Ohio.* An adjustable-fulcrum feeder linkage permits the operator to change the length of the nail produced while this machine is operating.

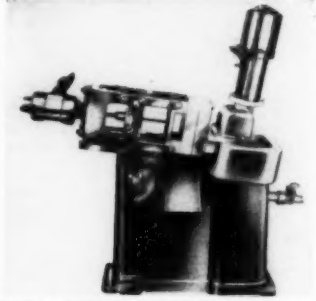


DIE-CASTING MACHINE — *DCMT Sales Corp., 164 Duane St., New York 13, N. Y.* This Model FA17 machine is identical with the previous model A16A, with the exception of fully automatic controls. Maximum capacity is 1 lb; die blocks used are 9x9x2½ in.



DIE-CASTING MACHINE — *DCMT Die Casting Machine Corp., 164 Duane St., New York 13, N. Y.* Zinc alloy die-casting machine of 1-lb capacity utilizes the principle of fast chill and high cycling speed on low-cost small single-impression dies.



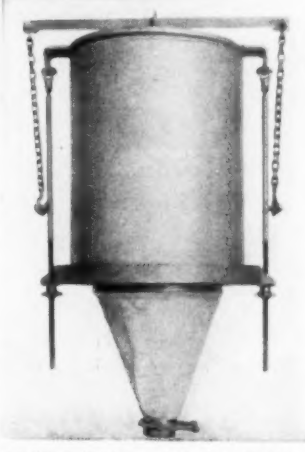


DIE-CASTING MACHINE — *DCMT Die-Casting Machine Corp., 164 Duane St., New York 13, N. Y.* Small air-operated 1-16 die-casting machine with automatic metal injection and automatic opening and closing has been developed.

DIE-CASTING MACHINE—*Hydraulic Press Manufacturing Co., Mount Gilead, Ohio.* Model 400-M is a self-contained, all-hydraulic die-casting machine for producing castings in magnesium, aluminum, or copper-base alloys. Designed for cold-chamber injection, the machine is said to produce castings that are relatively free of porosity because of the high sustained injection pressure.

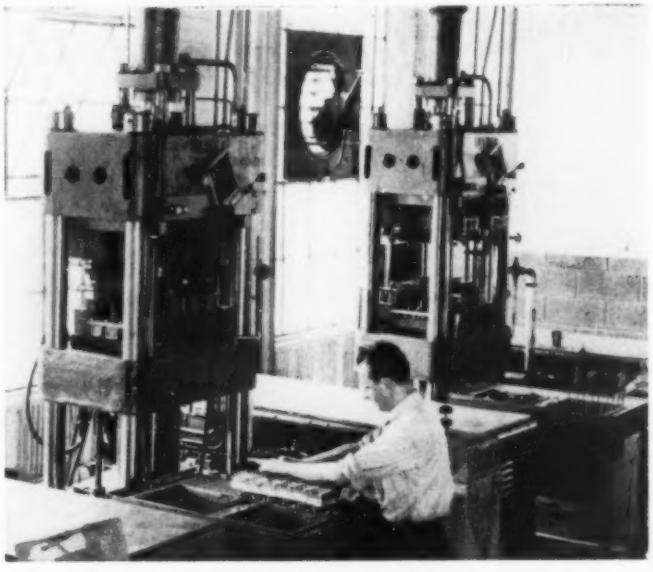
INJECTION-MOLDING MACHINE—*Watson-Stillman Co., Roselle, N. J.* With 21,000-psi nozzle pressure it is said to be the world's largest. It is capable of pressing out at one time plastic products approximately 200 oz. in weight.

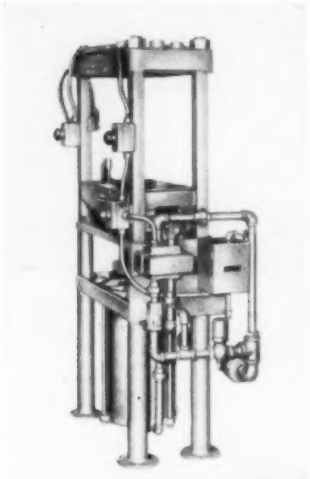
ANGLE MOLDING PRESS — *Elmes Engineering Div., American Steel Foundries, 1165 Tennessee Ave., Cincinnati 29, Ohio.* Standard 300-ton compression-molding press modified to meet special requirements. Equipped with two 50-ton horizontal transfer rams, it has a large die space readily accessible front and back.



DRUM SLING—*F. J. Stokes Machine Co., 5900 Tabor Road, Philadelphia, Pa.* Drum sling enables a single workman with a chain hoist to replenish the hoppers of molding and tabletting presses from drums holding up to 300 lb of material.

MOLDING PRESS—*Elmes Engineering Div., American Steel Foundries, 11 Tennessee Ave., Cincinnati 29, Ohio.* For plastics, it has a 35-ton transfer ram, is pushbutton-controlled, and has an automatic time cycle. Controls are tied in with high-frequency heating units. Size is 150 tons. →





MOLDING PRESS — *Hannifin Corp., 1118 So. Kilbourne Ave., Chicago 24, Ill.* For Plaskon-alkyd resins, it is adjustable to a 2-sec speed, if required, with a controlled slow-down of the platen at closing.

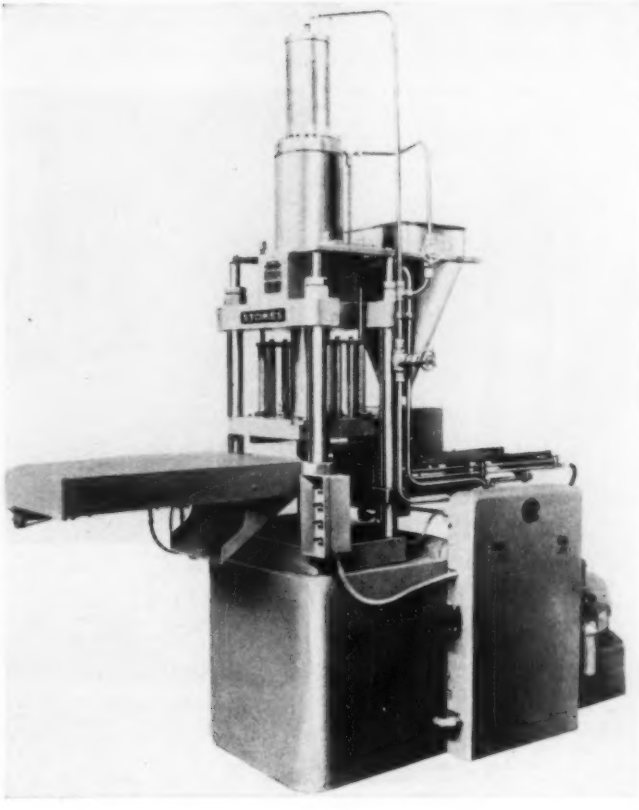
PRESS — *Elmes Engineering Div., American Steel Foundries, 1150 Tennessee Ave., Cincinnati 29, Ohio.* Minimatic presses, designed to handle low-pressure, fast-setting alkyd resins are produced in five cylinder capacities: 3-ton and 6-ton for air application, and 0.6-, 1.2-, and 2.4-ton for hydraulic service.

POWDERED - METAL PRESSES—*Snyder Tool & Engineering Co., Detroit, Mich.* The Colton-Haller vertical, single-punch hydraulic presses will be made in the following capacities: 25-ton with 5-in. fill, 40-ton with 8-in. fill, 100-ton with 9-in. fill, and 125-ton with 9-in. fill.

POWDER-METAL PRESS — *F. J. Stokes Machine Co., Philadelphia 20, Pa.* This powder-metal press produces a machine part from brass powder at rates up to 60 a minute. Known as Model F-4, it has a capacity of four tons.

MOLDING-PRESS PUMP—*Oracle Engineering & Sales Corp., Tucson, Ariz.* Heart of this pumping unit is a unique bypass sleeve, actuated in and out of pumping position by a snap-action control valve. Two separate pumping sections develop individual pressures.

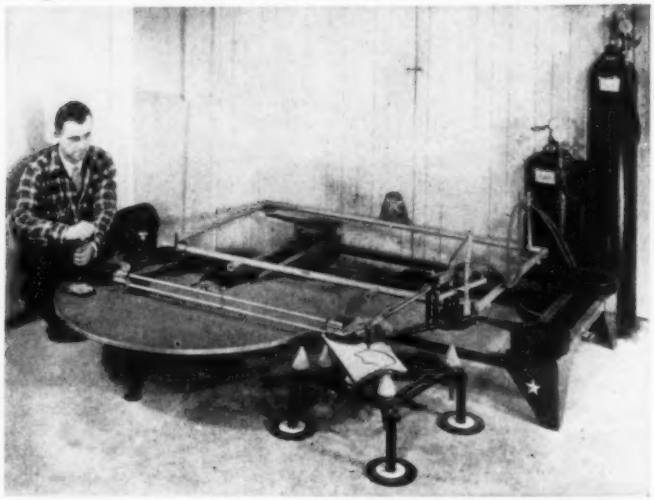
MOLDING PRESS—*F. J. Stokes Machine Co., 5900 Tabor Road, Philadelphia 20, Pa.* A press adapted for both the molding of conventional thermosetting materials, and fast-curing alkyd compounds. The change-over is made by opening and closing two valves. →

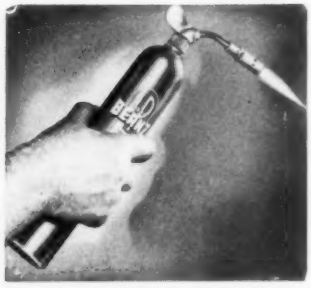


AMERICAN MACHINIST

1951 Welding and Heat-treating

PRODUCTION PREVIEW

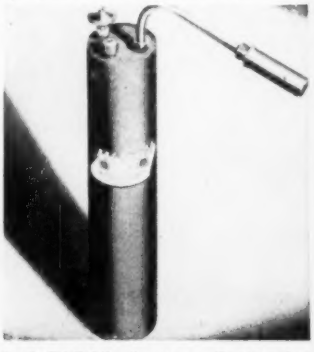




PORTABLE GAS TORCH—*Otto Bernz Co., Inc., 280 Lyell Ave., Rochester 6, N. Y.* A portable, propane-operated, gas hand torch is available with a replaceable cartridge.

CUTTING ELECTRODE — *All-State Welding Alloys Co. Inc., 273 Ferris Ave., White Plains, N. Y.* Cuts, pierces, gouges, chamfers or removes welds without the use of oxygen or special equipment.

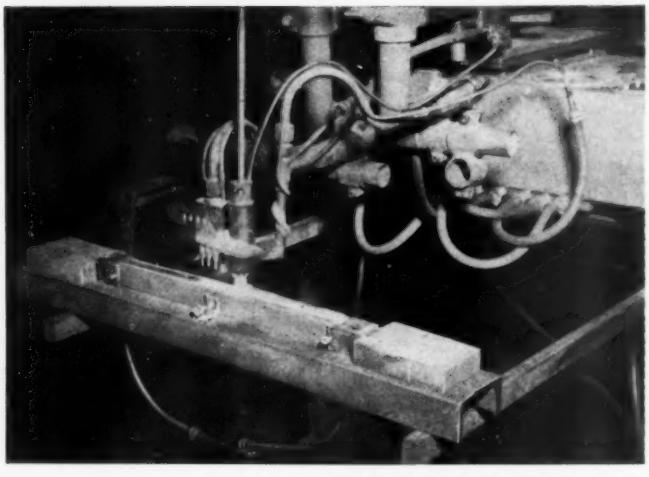
PANTOGRAPH TORCH HOLDER—*Krohn Manufacturing and Supply Co., Centreville, Mich.* For contour flame cutting and butt-welding, operating on the principle of the pantograph.

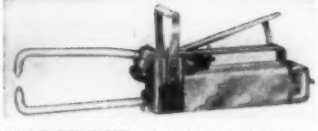


GAS TORCH—*Precision Engineering & Mfg. Co., 274 Center St., Saginaw, Mich.* Butane-propane gas torch weighs only 4 lb fully loaded and is capable of generating heat up to 2200 F.

WELDING GUN—*Graham Mfg. Co., Detroit, Mich.* High-current welding gun that attaches studs to thin metal without distorting the work or leaving a discernible heat mark. It welds to the back of painted, enameled, or polished parts, without marring the finished surfaces.

SPOT WELDER—*Raytheon Mfg. Co., Dept. 626 ONR, Waltham 54, Mass.* A bench-mounted spot welder utilizes a metallic-bellows air-storage system for consistent electrode pressure.

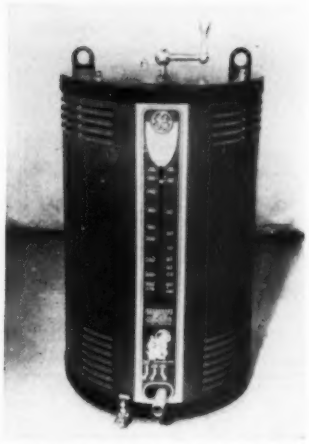




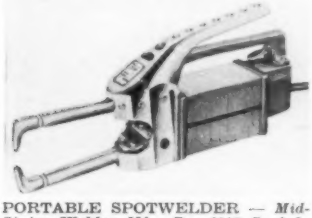
SPOTWELDER—*Greyhound A.C. Arc Welder Corp., 604-606 Johnson Ave., Brooklyn 6, N. Y.* Portable spotwelder can weld up to ¼-in. combined thickness of mild or stainless steel, or two pieces of 16-gage galvanized metal with a combined thickness of ⅛ in.

HARD-FACING—*Haynes Stellite Div., Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.* Mechanized hard-facing is a process for applying a protective coating to wearing parts on a production basis. Said to have these advantages: It is faster, the deposits produced are smoother and more uniform, and less hard-facing rod is required per piece surfaced.

SELF-EXCITED WELDER — *American Elin Corp., 1 Wall St., New York 5, N. Y.* Fully NEMA rated, Elin model RFN 300 dc arc welder is a single-operator, motor-driven series-excited unit, rated at 60-375 amp 1750 rpm.

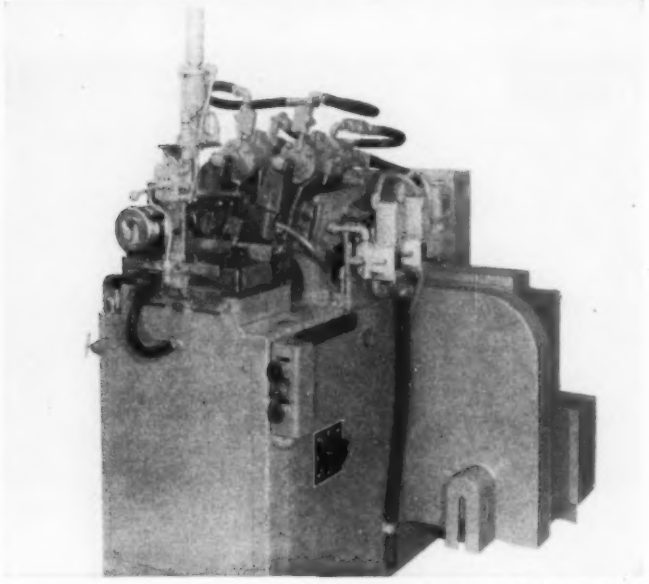


PORTABLE WELDER—*General Electric, Schenectady 5, N. Y.* Known as the 6WK30J Series, this welder line is said to be one of the first using silicone insulation. A high margin of safety and operating dependability is claimed for the insulation.

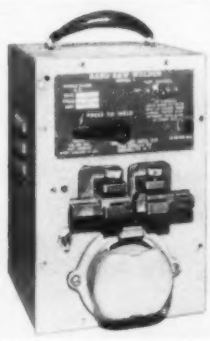


PORTABLE SPOTWELDER — *Mid-States Welder Mfg. Co., 6025 S. Ashland Ave., Chicago 36, Ill.* The fixed top tong of Zip spotwelders permits resting the weight of the welder on the exact welding spot. This gives added contact pressure for a sound weld, and reduces operator fatigue.

WELDER—*General Electric Co., 1 River Road, Schenectady, N. Y.* A high margin of safety and operating dependability is said to be provided by the 6 WK2OH silicone-insulated welder, since it is unaffected by high temperatures and is water repellent.



SPOTWELDER — *Taylor Winfield Corp., 1050 Mahoning Ave., Warren, Ohio.* For spotwelding spouts to stainless-steel coffee pots, it can, with minor gear and cam changes, be used for other products. Features automatic controls.



WELDER — *Brennan Mfg. Co., 228 Seeley St., Brooklyn, N. Y.* For bandsaw blades, it handles the new 0.050-in.-dia contour-cutting blades as well as all types of blades up to ½-in. flat. It is fully automatic.

HIDDEN-ARC WELDING — *Lincoln Electric Co., Cleveland 1, Ohio.* A process has been developed which uses either a 3/32-in.- or a 5/64-in.-diameter electrode wire at weld currents up to 600 amp. This current operating on the small cross-sectional area produces high current densities.

STUD WELDING — *Graham Mfg. Corp., 1541 E. Eight Mile Road, Ferndale 20, Mich.* In this portable stud welder the operator merely sets the air-pressure control and adds or subtracts condenser capacity. Once the controls are set, they remain constant.

TWEEZER WELDERS—*Federal Tool Engineering, Inc., 532 Mulberry St., Newark 5, N. J.* Operation of condenser-type tweezer welders is said to be uniformly reliable. 110-v lighting-circuit current or 250-v current is fed to condensers through vacuum tubes and transformers.

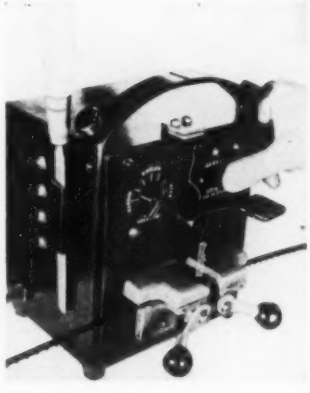
TRANSFORMER WELDERS — *Hobart Bros. Co., Hobart Square, Troy, Ohio.* An electrically adjustable reactor on this line of welders eliminates the usual cranking method of setting welding current.

STUD WELDER—*Nelson Stud Welding Div., Morton Gregory Corp., Lorain, Ohio.* This motor-operated generator set is capable of welding studs up to and including ¾ in. in diameter. Its performance is said to be equivalent to two conventional 400-amp generators in parallel.

SPOTWELDER — *Sciaky Bros. Inc., 4915 W. 67th St., Chicago 38, Ill.* The three-phase Moduwave welder tailors the current-wave shape to conform with the nature of the material being welded. Such divergent materials as aluminum alloys and nickel alloys can be welded with a simple change of control settings.

SPOTWELDER — *Delta Mfg. Div., Rockwell Mfg. Company, 600 E. Vienna Ave., Milwaukee 1, Wis.* Air-operated, 5-kva spotwelder is equipped with a weld-current control, weld-pressure control, an electronic weld-time control and a pneumatic dwell or off-time control.

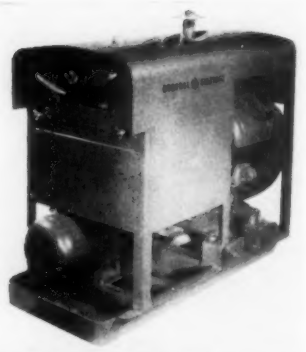
RESISTANCE WELDER — *The Taylor-Winfield Corp., Warren, Ohio.* This welder is complete with motor-driven Geneva indexing table, electrical controls, and automatic air-operated "pick-off" work ejector.



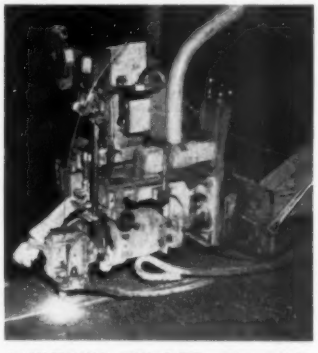
BUTT WELDER — *DoAll Co., Des Plaines, Ill.* Automatic 25-lb saw-blade welder permits on-the-spot welding and annealing of saw blades up to ½-in. wide.

RESISTANCE WELDER — *Sciaky Bros., Inc., 4915 W. 67th St., Chicago, Ill.* Employs indexing mechanism to weld seven-part electric motor housings. Parts are loaded on a 10-station indexing table by hopper and magazine feeds and welded at the rate of 2000 units per hr.

WELDER—*Sciaky Bros. Inc., 4915 W. 67th St., Chicago.* With 10 adjustable self-centering welding guns this welder for household-mixer bases has five series transformers rated at 31 kva with 50% duty cycle. The operator places the parts to be welded and initiates the cycle which completes all ten welds in one operation.



ARC WELDER — *General Electric, Schenectady 5, N. Y.* General-purpose WE-42AGW welder is driven by a 31-hp Wisconsin VP-4 air-cooled engine. Welder has a rated output of 200 amp at 40 v.



ALUMINUM WELDER—*The Linde Air Products Co., Unit of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.* Aluminum is welded automatically by the FSM-1 machine which uses an arc, maintained in a shield of argon gas between the electrode and the work.

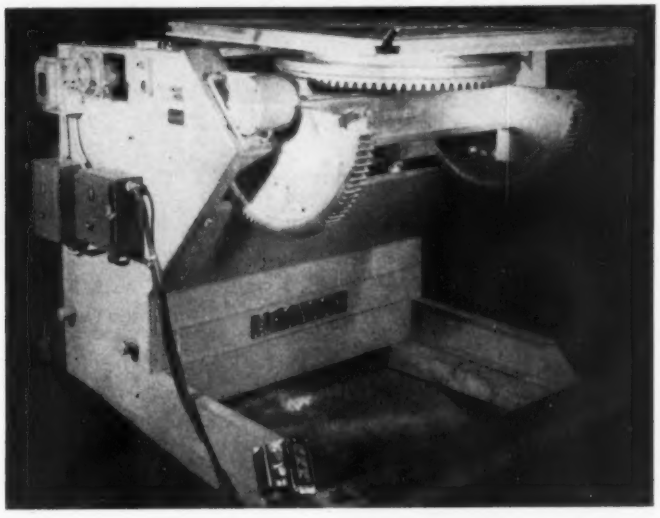
WELDER—*Hobart Bros. Co., Hobart Square, Troy, Ohio.* Heat adjustment is accomplished through an ac-dc reactor in this ac-transformer welder.

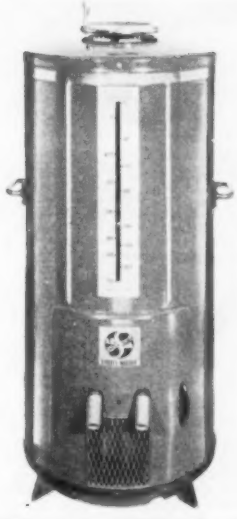
TORCH GOGGLES—*American Optical Company, Southbridge, Mass.* Free-floating headgear used on welding helmets has been adapted to support shielded goggles.

WELDING PLATE—*General Scientific Equipment Co., 2700 W. Huntingdon St., Philadelphia 32, Pa.* Plates filter out harmful ultra-violet and infra-red rays. Graded for density of shade and thickness as set forth in the U. S. Federal Specifications GGG-H-211.

WELDING - CONTROL SWITCH — *Hobart Bros. Co., Troy, Ohio.* Stand-mounted remote start-stop switch is equipped with arms providing finger-touch control. The weight of an electrode holder breaks the circuit and shuts off the welding machine.

WELDING GLOVES—*Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.* Three styles of gloves have been added covering three price ranges. Types A, B, and C are of similar construction. The A gloves use the best leather of the three.





WELDING TRANSFORMER — *A. O. Smith Corp., P. O. Box 584, Milwaukee 1, Wis.* Rated in accordance with NEMA specifications, 400 amp at 60% duty cycle, the Model 400E welding transformer retains full 75-v open-circuit voltage.

ELECTRODE — *Harnischfeger Corp., Milwaukee 14, Wis.* Choice of 14 different electrodes, each recommended for a different use, is offered in the P & H low-hydrogen electrode line. As-welded tensile strength varies from 74,000 to 142,000 psi and yield strength from 64,000 to 125,000 psi.

ALUMINUM ELECTRODE—*Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* Welding electrode for aluminum and aluminum alloys, Eutectrode 2101 is said to have tensile strength of 34,000 psi.

WELDING POSITIONER — *Aronson Machine Co., Arcade, N. Y.* Heavy-duty positioners have been designed from the automatic-welding standpoint, so that they have all the necessary features. Features include machined, fabricated sector and bull gears for rotation and tilt.

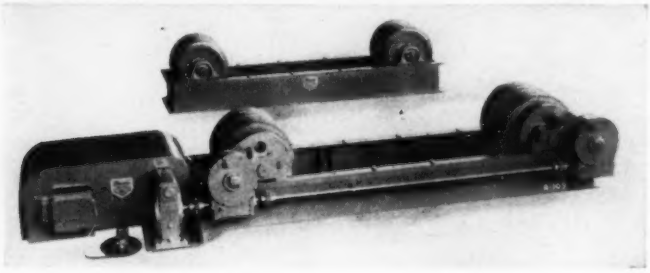
WELDING TABLE—*Challenge Machinery Co., Grand Haven, Mich.* Built of semi-steel, this welding table is 6-in. thick and provides a rigid, smooth, and square surface. T-slots facilitate assembling and locating.

WELDING ELECTRODE — *Welding Electrode and Equipment Div., A. O. Smith Corp., Milwaukee, Wis.* Designated as Smithway SW 80 for field welding of line pipe. Coating is of the cellulose type, said to produce a deep-penetrating cutting arc.

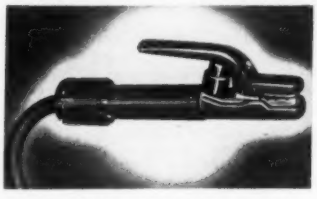
ELECTRODE—*General Electric, Schenectady 5, N. Y.* The W-22 electrode is designed specifically for vertical and overhead welding in mild steel. Its penetrating arc suits it for welding galvanized-plate stock, and for lap joints and edge welds.

WELDING CLAMP — *Adjustable Clamp Co., 417 North Ashland Ave., Chicago 22, Ill.* Jorgensen shielded clamps have been adapted to a general service weight in Style No. 120-S. Available in all sizes from 2- to 12-in. opening.

WELDER'S CLAMPS—*Bernard Welding Equipment Co., 741 E. 71st St., Chicago 19, Ill.* One face of each of the two rotating clamps of the Model B Pro-Clamp has a flat surface for gripping flat work, and the opposite face is V-formed for handling round pieces.



TURNING ROLLS — *Worthington Pump & Machinery Corp., Welding and Assembly Positioning Equipment Div., Harrison, N. J.* Model 75 turning rolls are said to be quicker and easier to maintain since the complete drive is removable for maintenance or replacement. Both power and idler models have turning capacities of 75 tons.



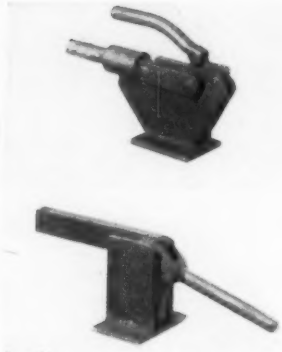
ELECTRODE HOLDER — *Foster-Transformer Co., Cincinnati, Ohio.* Consisting of two parts, a control box, housed in stainless steel and mounted on the welding machine, and a standard holder equipped with a special grip, this device transfers all of the machine controls to the electrode holder.

WELDING POSITIONER — *Aronson Machine Co., Arcade, N. Y.* The construction of TracTred turning rolls lends itself to incorporating a continuous track conveyor system for the assembly, welding, and grinding of tanks.

HIGH-SPEED ELECTRODE—*Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* The 5/32-in. Steel-Tectic electrode, which welds bead over bead without need for removing slag, can be used at currents as low as 50 amps on thin steel without danger of burning through.

TUNGSTEN ELECTRODES — *Tungsten & Chemical Div., Sylvania Electric Products, Inc., Towanda, Pa.* Pure tungsten electrodes, having a melting point of 6000 F, for atomic-hydrogen and gas-shielded electric-arc welding of a wide range of metals.

ELECTRODES—*Arcos Co., 1500 So. 50th St., Philadelphia 43, Pa.* Low-hydrogen Tensilend welding electrodes are said to simplify fabrication by elimination of preheat in welding low-alloy high-strength steels.



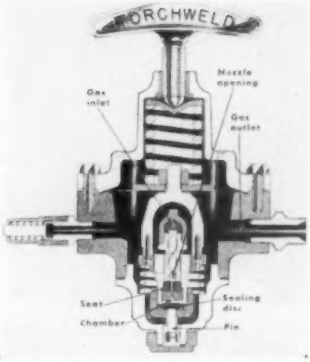
CLAMPS — *General Welding Corp., Cleveland, Ohio.* The plunger clamp, Model D-2 (top) employs a bronze plunger so that weld spatter will not adhere to it and foul up its operation. Model C-2 (bottom) is a horizontal toggle clamp recommended especially for milling and drilling operations.

ELECTRODE HOLDER—*The Lincoln Electric Company, Cleveland 1, Ohio.* The advantages of both tong and hole holders are combined in the LJ-1 insulated electrode holder to provide a strong grip, yet easy thumb-pressure release.

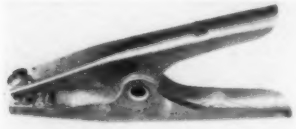
HARD-FACING ALLOYS — *Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* The Eutechrom line of electrodes and gas rods are available in the following additional types: For water-hardening steel, oil-hardening steel, air-hardening steel, high-speed steel, and for hot-working tools, dies.

ELECTRODE HOLDER — *Bernard Welding Equipment Co., Chicago 19, Ill.* Limiting factor in volume of current which can be sent through holders is the resistant heat produced. Shortstub is designed so that the welding current is through a cable which connects directly to the end of the electrode.

WELDING CABLE—*The Lincoln Electric Co., Cleveland 1, Ohio.* For both electrode and ground. Claimed to have both increased cable life and flexibility.



WELDING REGULATOR — *National Cylinder Gas Co., Chicago 11, Ill.* The Torch Weld, "6500" welding and cutting regulator maintains constant volume and pressure of gas without requiring two-stage reduction. A pressure-compensating unit in the valve-seat assembly counteracts effects of decreasing cylinder pressure.



GROUND CLAMP — *Lincoln Electric Co., Cleveland, Ohio.* This welding clamp weighs 1½ lb, has jaw spread of 2½ in., and is to be used on jobs where welding currents do not average over 300 amps.

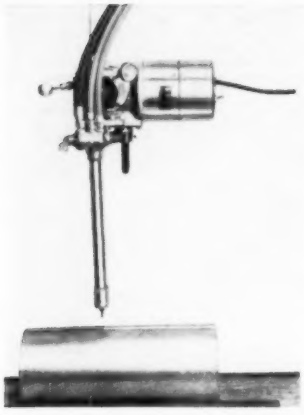
COLD-WELDING ELECTRODE — *Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* Amperage required for running the improved Eutectrode 24 is said to have been substantially reduced. The 5/32-in. size which normally requires 120 to 125 amp can now be deposited at 80 to 90 amps.

ELECTRODE—*General Electric Co., 1 River Road, Schenectady 5, N. Y.* Reverse-polarity dc arc-welding electrode is available in 5/32- and 3/16-in. dia for field trial. Used for d.c. welding of low-alloy, high-tensile steels, such as pipelines.

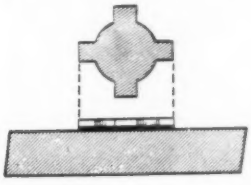
CAST-IRON ELECTRODE — *All-State Welding Alloys Co., Inc., 273 Ferris Ave., White Plains, N. Y.* For general welding of cast iron, especially wherever free machinability and color match are required, this 15-in. cast-iron electrode is recommended.

HARD-FACING ELECTRODE — *Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* Designated as EutecTrode 10, it deposits a bead having a hardness of 63-68 Rockwell C. Said to be able to withstand high temperatures.

THORIATED-TUNGSTEN ELECTRODES—*Air Reduction, 60 E. 42nd St., New York 17, N. Y.* Non-consumable electrode for inert-gas-shielded arc welding. The electrodes are said to operate much cooler than standard electrodes, thus permitting the use of higher currents on a given size.



SOLDERING GUN—*Metallizing Co. of America, 3580 W. Carroll Ave., Chicago 24, Ill.* Brazing or soldering is being done with a gun which is used to feed the wire at some fixed speed which synchronizes with the speed of the workpiece along a conveyor belt.

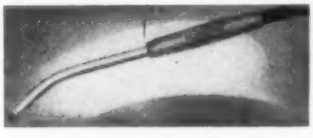


SILVER-BRAZING ALLOY — *Rolled Plate Div., American Silver Co. Inc., Flushing, N. Y.* A development known as Braze-Clad, consists of laminating a layer of silver brazing alloy to one or both sides of non-ferrous metals in strip form. Can be of any specified thickness and in any commercial melting range.

SOLDERING TOOL—*Phillips Mfg. Co., Inc., 2816 Aldrich Ave. S., Minneapolis, Minn.* This solderer called the Versa-Tool combines heating elements, transformer, light, two-position switch, and fuse into a single unit.

BRAZEABILITY CHECK—*Riverside Metal Co., Riverside, N. J.* Test pieces are put into a combustion tube furnace and held for 15 min at 2050 F. If the surface is bright, the heat is acceptable.

SOLDERING TOOL—*Ideal Industries, Inc., 1057 Park Ave., Sycamore, Ill.* There is no preheating or waiting with the standard 1000-watt Thermal-Grip soldering tool. Touching the work completes secondary power circuit and heating begins instantly.



SOLDERING IRON — *Palmer Mfg. Co., Inc., Woodside, L. I., N. Y.* Instant heating Solderweld iron is a miniature model which will work from a 6-volt source, either a battery or a line transformer.

SOLDERING ROD—*Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.* 155 has a bonding temperature of just 700 F and is for soldering both ferrous and non-ferrous metals.

SILVER ALLOY—*Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.* For brazing ferrous, non-ferrous, and dissimilar metals. Put out in packets containing a coil of 1/16-in. wire and instructions for use.

BRAZING WIRE — *Air Reduction Sales Co., 60 E. 42nd Street, New York 17, N. Y.* Aluminum brazing wire is more resistant to corrosion and is claimed to produce high-pressure fittings with fewer leaks than wire formerly sold.

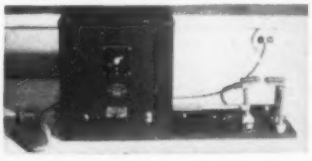
STEEL SORTER — *Fisher Scientific Co., Pittsburgh 19, Pa.* Portable electronic instrument distinguishes between steel sections of the same physical dimensions by measuring their magnetic properties.

SILVER SOLDERING FLUX — *Farrelloy Co., 1217 North 26th St., Philadelphia 21, Pa.* Known as AG, it is a low-temperature flux that is said to have a powerful scavenging action.

BRAZING ALLOY — *Wall Colmonoy Corporation, 19345 John R Street, Detroit 3, Mich.* For stainless steels, it is said to be heat and corrosion resistant. Held in place with cement, it will flow through a joint by capillary action when heated to 2050 F.

SANDWICH BRAZE—*General Plate, Div. of Metals and Controls Corp., Attleboro, Mass.* Called Bondwich it consists of two sheets of brazing material and a stress-absorbing shim bonded into a single sheet for easier handling.

SOLDERING GUN—*Weller Electric Corp., Easton, Pa.* Dual spotlights to eliminate shadows, and over-under terminals to brace tip and improve visibility, are features of this soldering gun.

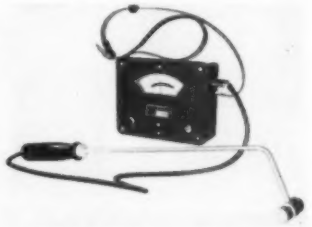


SOLDERING TOOL — *Luma Electric Equipment Co., Toledo, Ohio.* The soldering electrodes on this tool are solenoid operated, and controlled by a foot switch.

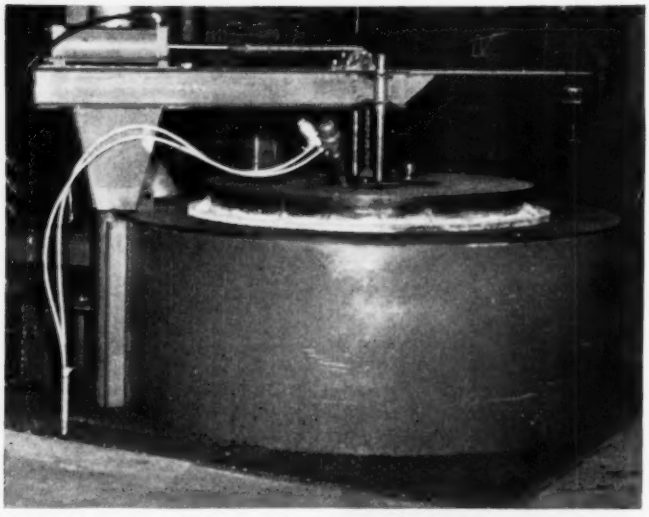
FORCE INDICATOR—*Hunter Spring Co., 1 Spring Ave., Lansdale, Pa.* This instrument uses a compensated-spring mechanism and a fully-jeweled dial indicator to measure and indicate force.

ALL-METAL SOLDER—*Farrelloy Co., 1217 North 26th St., Philadelphia 21, Pa.* Solder is a non-reactive metallic combination said to show high resistance to atmospheric, alkaline, or acid corrosion.

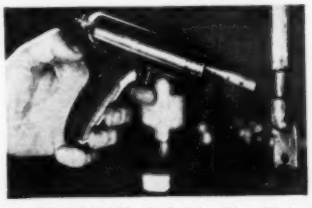
SOLDERING FLUX—*Division Lead Co., 836 W. Kinzie St., Chicago 32, Ill.* In liquid form, it is said to eliminate practically all of the cleaning and burnishing of metal parts usually necessary before job can be done.



MEASURES TIN CONTENT—*Wheelco Instruments Co., Chicago 7, Ill.* Portable indicator provides a means of determining the ratio of the lead and tin content in solder for process standards.

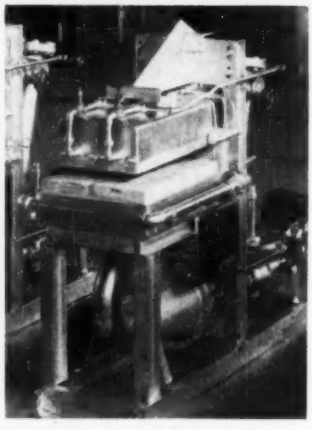


HEAT-TREATING FURNACES—*Standard American Engineering Co., W. 43rd St., Lyons, Ill.* This furnace achieves a uniform control temperature quickly, using a variable-speed fan which is thermocouple controlled.



BLOW TORCH—*Bakelite Div., Union Carbide & Carbon Corp., 122 E. 42nd St., New York 17, N. Y.* Flames in excess of 2700 F are produced by this alcohol blowtorch. The tool has a built-in safety stand that enables it to be set in various positions leaving operator's hands free.

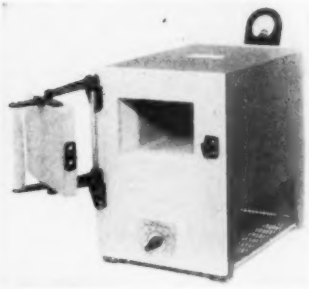
CONVECTION FURNACE — *W. S. Rockwell Co., 200 Eliot St., Fairfield, Conn.* The heating chamber of this electric recirculating-air pit furnace is insulated with 4½-in. layer of refractory brick, backed up with 3½ in. of block insulation. The unit is for drawing, tempering, and normalizing to 1200 F.



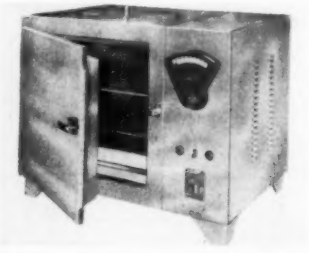
END HEATING FURNACE—*Surface Combustion Corporation, Toledo 1, Ohio.* Furnaces have a capacity of 180 1-in.-dia bars per hr. Each unit has a 15-in.-wide heating zone and 1,210,000 Btu per hr input.

HEAT-TREATING MACHINE—*Selas Corp. of America, Erie Ave. and D St., Philadelphia 34, Pa.* Heavy-duty chisels are hardened and drawn in local sections at both ends at a rate of 60 per hr on this automatic gas-fired machine. Adaptable to size and shape of pieces.

INDUCTION HEATING — *The Ohio Crankshaft Co., 3800 Harvard Ave., Cleveland.* A Tocco induction-heating system consists of three basic units, a heating station, a rectifying and oscillating unit, and a motor-generator set.



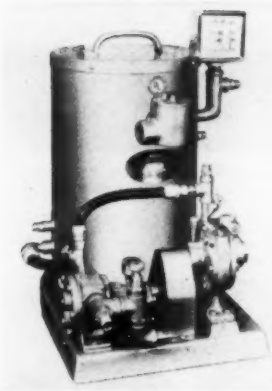
MUFFLE FURNACE—*Western Gold & Platinum Works, 589 Bryant St., San Francisco, Calif.* The temperature control on this furnace permits the operator to select and hold automatically any desired temperature up to 2000 F.



CONVECTION OVEN—*Modern Electric Laboratory, 306-308 West 69th St., Chicago 21, Ill.* Blue M Hi-Heat electric gravity convection ovens are available with controls having ranges to 800, 1000, and 1200 F. Housing and door are of polished stainless steel.

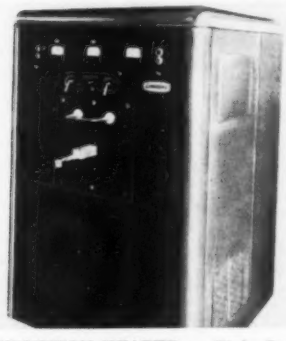
PORTABLE HEATER — *Lepel High Frequency Laboratories, Inc., New York, N. Y.* A 1-in. length of steel rod can be heated to 1500 F in approximately 3 sec by this high-frequency induction heater.

INDUCTION HEATER — *Laboratory Equipment Div., Lindberg Engineering Co., 2444 W. Hubbard St., Chicago 12, Ill.* High-frequency induction heater is for carbon and sulphur analysis of iron and steel by direct combustion at temperatures in excess of 3000 F.



PAINT HEATERS — *Bede Products Inc., 4311 Ridge Road, Cleveland 9, Ohio.* A process for spraying paint, varnish, and lacquer at steaming-hot temperatures is said to have the advantages of better-looking, higher-quality painted surfaces, and substantial cost reductions.

INDUCTION HEATER—*Lepel High Frequency Laboratories, Inc., New York, N. Y.* Combination worktable and quench tank can be easily attached to vacuum-tube or spark-gap converters. Heating and quenching cycles are controlled by a three-circuit timer.

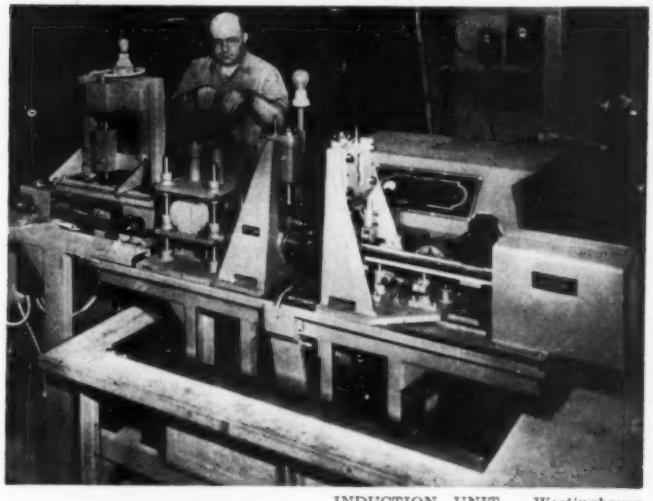


INDUCTION HEATER — *High-Frequency Heating Division, Lindberg Engineering Co., 2444 W. Hubbard Street, Chicago 12, Ill.* On 100% duty basis the LI-10 induction-heating unit can provide more than 10 kw into a suitable load.

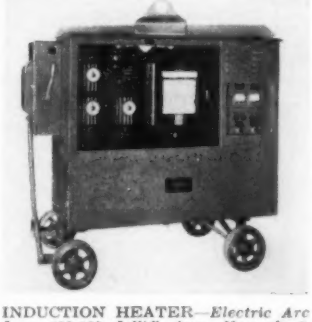
FURNACE PANEL—*Thermo Electric Mfg. Co., 461 W. Locust St., Dubuque, Ia.* The prewired panel is available with several sizes of furnaces, and houses the temperature controller, together with a load-carrying relay, thermocouple lead, and fuse-disconnect switch.

HAND TORCH—*Otto Bernz Co., Rochester, N. Y.* Features of this aluminum torch are a stronger, flared tank design, resulting in greater fuel capacity; weight balance at any fuel level; and better appearance.

FORGE FURNACE—*The Lithium Co., 111 Sylvan Ave., Newark, 4, N. J.* Protection up to 2400 F against scaling during heating of steel is provided in this vertical-slot forge furnace by a slight coating of lithium.



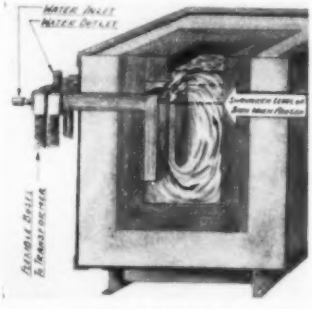
HEATING SYSTEM — *Electric Arc Inc., 152-162 Jelliff Ave., Newark 8, N. J.* Operated in conjunction with a 40 kva Model RTA regulating unit, the Model AC3 low-frequency induction-heating unit, is for preheating before welding and stress relieving after welding.



INDUCTION HEATER—*Electric Arc Inc., 152-162 Jelliff Ave., Newark 8, N. J.* Model BHD-S Smith-Dolan induction heater is essentially two units each energized independently by its own contactor. Voltage changers are made by rotary selector switch, so designed that no changes are possible when carrying a load.

INDUCTION UNIT — *Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.* R-F induction equipment hardens cylindrical parts continuously at feed rates to 6 in. per sec. It consists of an automatic-loading device, a horizontal rotating scanner, and an industrial radio-frequency generator.

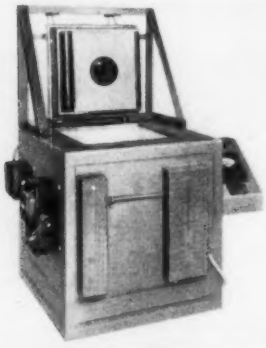
INDUCTION HEATER — *Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.* Hardens spur gears, cluster gears, integral spindle gears, and shafts; carrying each gear through an automatic cycle for either through or contour hardening of each part.



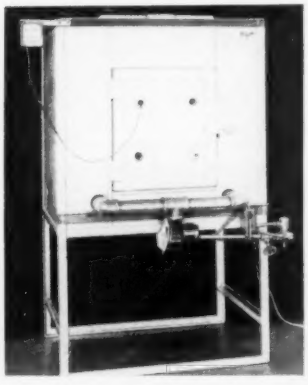
SALT-BATH FURNACES — *Ajax Electric Co. Inc., Frankford Ave. at Delaware, Philadelphia 23, Pa.* Hultgren furnaces are equipped with submerged electrodes. They are closely spaced to produce electrodynamic stirring action which is said to provide temperature uniformity within 5 F.

PLASTIC OVEN—*The Miskella Infra-Red Co., E. 73rd and Grand Ave., Cleveland 4, Ohio.* The Spira-Veyer heats plastic powder for injection and extrusion molding by infra-red heat. The powder travels up the spiral ramp by vibratory action.

HAND TORCH — *Pressure Products Corp., 140 N. Dearborn St., Chicago 2, Ill.* A self-pressurizing fuel for flame tools called Prepo is packaged in a seamless throw-away container. The fuel fits in the holder of a hand torch which requires no pumping or priming.



ELECTRIC FURNACE—*K. H. Huppert Co., Chicago, Ill.* Vertical furnace is for basket heating and steel hardening. One circulating model heats to 1250 F. A second has a max. temp of 2000 F without recirculation.



FURNACE—*A. D. Alpine, Inc., 11837 Teale St., Culver City, Calif.* Precision furnace for the heat-treating of metals is available in capacities ranging from 1.8 to 20 cu ft and has a range of from 0 to 2500 degrees.

INDUCTION-HEATER—*Fisher Scientific Co., Pittsburgh 19, Pa.* This automatic high-frequency heater makes possible rapid and accurate carbon determinations in all kinds of ferrous materials.

PREPARED-ATMOSPHERE GENERATOR—*Surface Combustion Corp., Toledo, Ohio.* Known as the MRX-800, it is the company's largest-capacity endothermic generator to be developed as a standard-rated catalog unit. It produces 800 cfh of atmosphere gas.

HEATING ELEMENTS—*Trent, Inc., 4599 Wilde Street, Philadelphia 27, Pa.* Standard size folded-and-formed heating racks can be arranged horizontally or vertically in all types of equipment to supply from 1.5 to 300 kw.

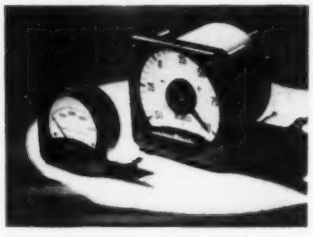
INDUCTION HEAT-TREATING—*Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Pa.* Nonferrous metal strip is being heat-treated by a transverse-flux method. Magnetic flux is directed perpendicular to the surface and through the strip instead of along its length.

PYROMETER — *The Pyrometer Instrument Co., Inc., Bergenfield, N. J.* The Bi-Optical pyrometer is a direct-reading instrument based on the use of light filters and color wedges which are transparent to a number of colors simultaneously.

PYROMETER—*Wheelco Instruments Co., 847 W. Harrison St., Chicago 7.* Indicating pyrometer, Model 192, features: High-resistance "edgewise" movement with Alnico V-magnet; mirrored scale is fully compensated.

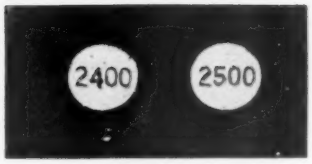
MERCURY THERMAL SYSTEM—*Taylor Instrument Companies, Rochester 1, N. Y.* This thermal system measures temperatures above the conventional 1000 F in gas-fired ovens, annealing ovens, high-temperature blanchers, and in exhaust systems, among other applications.

BEARING-TEMP. METERS—*Assembly Products, Inc., Chagrin Falls, Ohio.* Multiple-meter controls give remote indication of bearing temperature, providing automatic alarm, machine shutdown, or automatic correctives in case of excess heat.



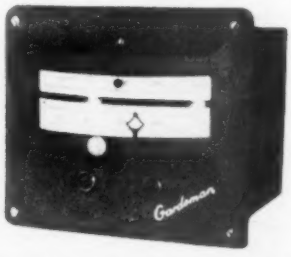
TEMPERATURE INDICATORS — *General Electric Co., 1 River Rd., Schenectady 5, N. Y.* Cold-end compensated thermocouple thermometers for temperatures up to 3000 F and resistance thermometers for temperatures up to 300 F are included in this line.

HEAT CONTROLLER — *Assembly Products, Inc., Chagrin Falls, Ohio.* The Simply-trol contact meter-relay indicating and controlling unit, for processes and operations, is available in all ranges of voltage and current. Responsive to changes of one-half microampere or a fraction of a millivolt.

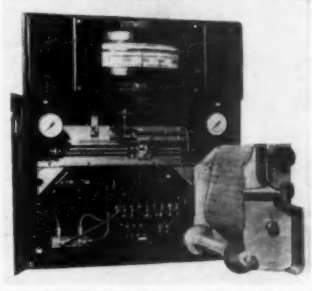


TEMPERATURE INDICATORS — *Tempil Corp., 132 West 22nd St., New York 11, N. Y.* Beginning with 113 F, Tempil pellets are available in 2½° steps to 400 F, in 50° steps from 400 to 2000 F, and in 100° steps from 2000 to 2500 F.

PYROMETER — *Assembly Products, Inc., Chagrin Falls, Ohio.* Provided with automatic protection from thermocouple burnout. Called the Simplytrol, it is a thermocouple millivoltmeter controller with control action obtained by direct contact in the meter.



PYROMETRIC CONTROLLER—*Taco West Corp., 525 W. Noble St., Chicago 22, Ill.* The Gardsman controller (Model J) operates on electronic principles without any physical contact to the movement pointed.



STRIP-CHART RECORDER—*Wheelco Instrument Co., 847 W. Harrison St., Chicago 7, Ill.* Temperature, speed, flow pressure, static grain loads, ac or dc volts and current can be measured and recorded on the Capacilog. Air power operates the diaphragm motors.

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As a reader of American Machinist you know the value of the Special Reports. You know how useful as reference material their compact, comprehensive coverage of metalworking subjects has been. Each report represents months of research by one or more editors. Published in nearly every issue for the past six years, their total distribution runs into the millions.

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	6	24	42	60
	7	25	43	61
	8	26	44	62
	9	27	45	63
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	8	26	44	62
	9	27	45	63
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43	How Modern Mechanical Presses Operate	11/17/49	25¢
44	Automatic Sizing Devices	12/ 1/49	15¢
45	Optical Tools for Shop Precision	12/15/49	15¢
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52	How Tooling Affects Design of Metal Powder Parts	4/17/50	15¢
53	How to Mark Your Product	5/ 1/50	15¢
54	Know Your Hand Tools	5/29/50	20¢
55	How to Select Mechanical Presses	6/12/50	15¢
56	Machining Plastics	6/26/50	15¢
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58	Multiple Spindle Bar Machines	7/24/50	25¢
59	How to Stop That Waste in Machining	8/ 7/50	25¢
60	Carbon Restoration Overcomes Soft Skin on Parts	8/24/50	15¢
61	How to Cut Costs With Cutting Fluids	9/18/50	15¢
62	How to Lap	10/ 2/50	20¢
63	How to Work Tool & Die Steels I	10/16/50	25¢
64	How to Make Armament	10/30/50	25¢
65	Disaster Control	11/13/50	50¢
66	Machinability Depends on Microstructure	11/27/50	25¢
67	Tools and Die Steels II	12/11/50	25¢
68	Machinability Data for High Temperature Alloys	12/25/50	25¢
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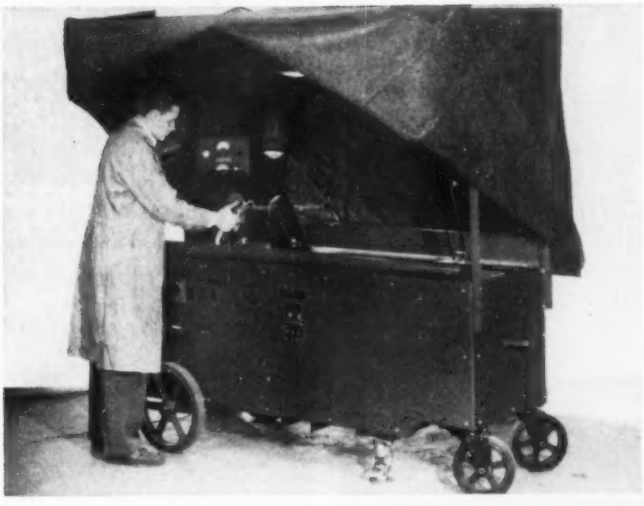
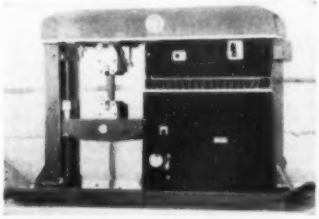
(Or use the postcards on page 213)

Layout and Inspection



DEFECT INSPECTION — *Magnaflux Corporation, 5900 Northwest Highway, Chicago 31, Ill.* The KDN unit is a small portable wet-type inspector which uses Magnaglo. Self-contained and can be plugged into any 220-v line for operation and inspection of parts up to 54-in. long.



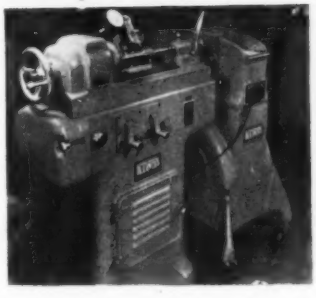
TESTING MACHINE—*National Forge & Ordnance Co., Irvine, Pa.* Table-model testing machine for tension, compression, flexure, shear, and transverse tests is available in two capacities: 30,000 lb and 15,000 lb.

MAGNETIC - INSPECTION UNIT—*Magnaflux Corp., 5900 Northwest Hwy, Chicago 31, Ill.* A portable, general-purpose unit is said to make readily visible all defects such as fatigue cracks, shrink cracks and weld cracks.

HARDNESS TESTER—*Peabody Industries Inc., 1863 Penobscot Bldg., Detroit 26, Mich.* The pocket Metallometer, said to bring shop-wide quality control at a new low cost, is placed on the surface to be checked, the hammer released, and the readings read off.

HARDNESS TESTER. *J. P. Newman Co., 5544 East Fowler St., Los Angeles 33, Calif.* Throat opening of the Newman hardness tester is 1½ in. and the unit covers the Rockwell C, B and E scales. Over-all size is 9x9 in. with a 3-in. face and weight is 4½ lb without base.

MACHINE-CONTROL BOARD — *The Cross Co., Detroit, Michigan.* Basic components of this unit are a master control board, a master toolsetting fixture, a work bench, and Toolometers which automatically shut down the machine when tools need changing.



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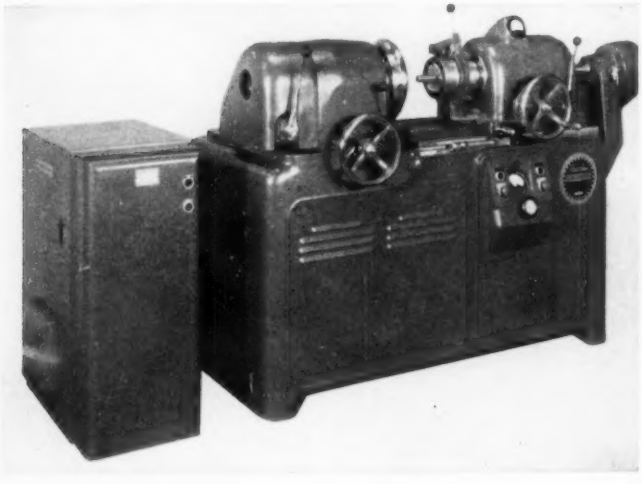
HOB-LEAD CHECKER—*Illinois Tool Works, 2501 N. Keller Ave., Chicago 39, Ill.* Produces graphic record showing exact location of each tooth on a hob in relation to all other teeth and in relation to desired theoretical lead helix.

GEAR TESTER—*National Broach and Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.* This Red-Ring machine is being used to test automatic-transmision pinions for nicks by running them in mesh with a master gear. The pinion is merely slipped onto its spindle in the rocking workhead.

GEAR TESTER — *National Broach and Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.* Each operating head has its own dc motor on the Model GSQ Gear Sound Tester. Controlled through a single rheostat, the motors operate in the same direction and at any selected speed within the range found in gear operation under actual service conditions.



DYNAMIC BALANCER—*R. B. Annis Company, Indianapolis, Ind.* For precision balancing of high-speed rotating parts weighing to 20 lb. Both phase and amplitude of unbalance are plotted simultaneously on the screen of a cathode-ray tube.

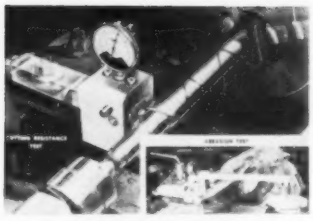
TESTER — *Riehle Testing Machines Div. American Machine and Metals, Inc., East Moline, Ill.* Riehle has added a 30,000-lb-capacity testing machine to their electronic-control line. A Pendomatic indicating unit eliminates loose-balancing weights and wrong combinations.

HARDNESS TESTER—*The R. Y. Ferner Co., 110 Pleasant St., Boston 48, Mass.* Portable Brinell-hardness tester has three sizes of ball penetrators, separately mounted and interchangeable. The sizes are 2.5, 5, and 10 mm.

PORTABLE HARDNESS TESTER—*Newage International, Inc., 521 Fifth Ave., New York, N. Y.* Direct and accurate readings can be taken on this tester. It allows fast testing of repetitive or assembly line work by unskilled labor.

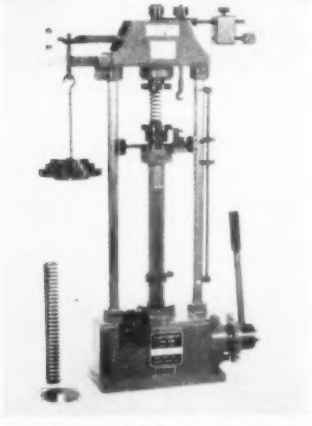
MAGNETIC INSPECTION — *Sonoflux Corp., Oil and Gas Bldg., Houston, Texas.* A part to be tested is centered in this magnetizing coil. A special Sono-powder is sprinkled uniformly over the article and gently blown off by vibrations resulting from ultrasonic impulses generated by the coil. Remaining Sono-powder will adhere and outline defects.

ABRASIVE TESTER—*Taber Instrument Corp., 111-AM Goundry St., North Tonawanda, N. Y.* The Abraser incorporates the company's rotary rub-wear action of dual abrading wheels. Action is continuous throughout the 360° rotation of the specimen and approximates wear encountered in actual use.

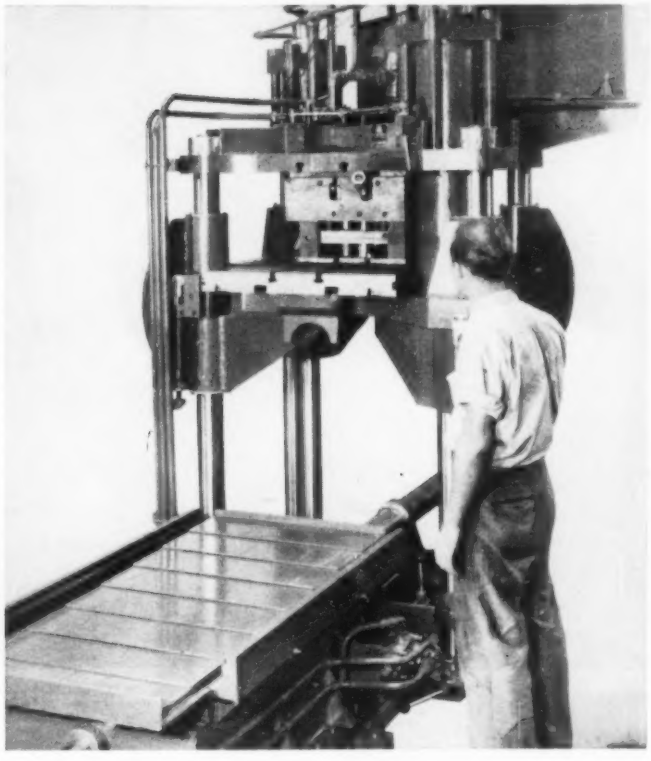


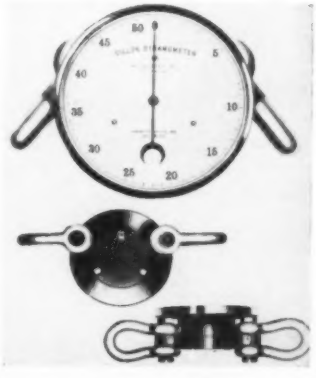
MACHINABILITY TESTER—*Vanton Equipment Corp., Empire State Bldg., New York 1, N. Y.* The M.S.E. Schlesinger machinability tester is said to offer a machinability index capable of development into a variable universal standard. The tester measures specific cutting resistance exerted by a material against the penetration of a standard cutting tool. Also the abrasiveness effect of the same work material on a hardened calibrator.

VIBRATION MEASURER — *Electro Products Laboratories, Inc., 4501 North Ravenswood Ave., Chicago 40, Ill.* Consists of a mechanical micrometer head with sensing unit, and an electronic cabinet.



SPRING TESTING—*The Carlson Co., 277 Broadway, New York 7, N. Y.* Testing machines that are essentially precision beam balances of the simple lever type, using a fulcrum, knife edges, and dead weights. They test both compression and tension springs for load and deflection.

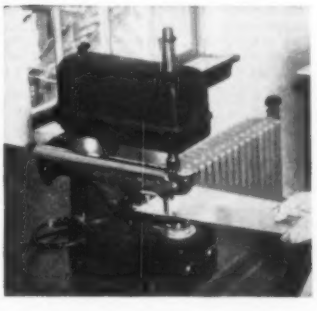




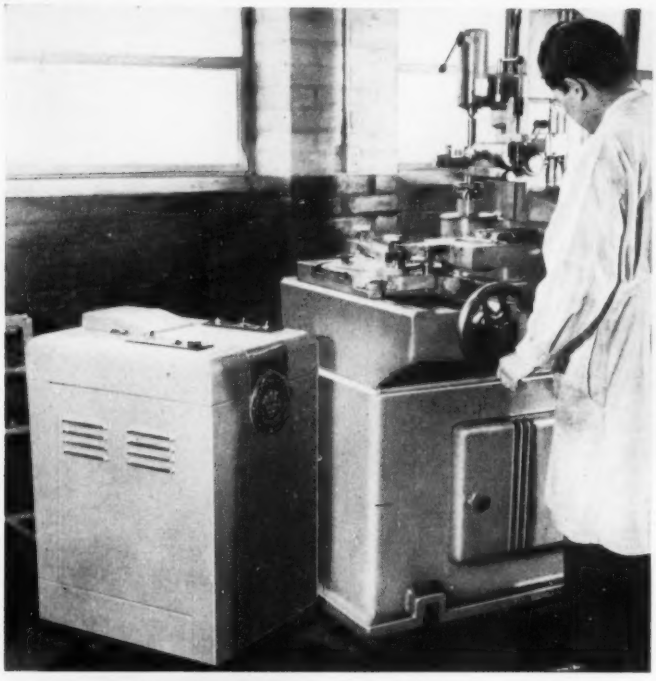
DYNAMOMETERS—*W. C. Dillon & Co., Inc., 5410 West Harrison St., Chicago 44, Ill.* High-capacity dynamometers check drawbar pull, weight of bulky objects, or tension in ropes or cables for static loads.

STROKE COUNTER — *Durant Mfg. Co., 1929 North Buffum St., Milwaukee 1, Wis.* Model PVR is a stroke printing counter which provides both visual and printed records of machine production.

DIE TESTER — *Lester Engineering Co., 2711 Church Ave., Cleveland 13, Ohio.* Die-testing machine to open and close dies so that the parting line can be matched perfectly before the die leaves the toolroom. A bottom platen first moves down and then moves horizontally, the die is worked on, and then moved up in alignment for checking.

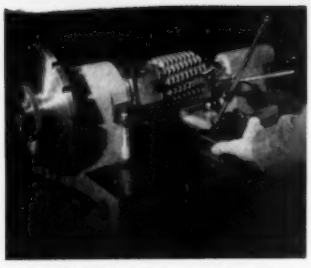


HARDNESS TESTER—*Topflight Tool Co. Inc., 116 E. Market St., York, Pa.* Includes an adaptation of a Barcol unit that can be set for the desired hardness. By means of a conversion chart, Brinell, Rockwell, or Vickers numbers can be certified.



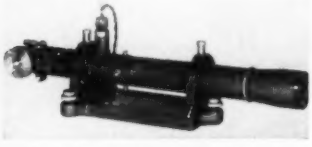
INSPECTION FIXTURE—*The Sheffield Corp., Dayton 1, Ohio.* With the Sheffield 18-column Precissionaire fixture, turbine blades are checked as fast as they can be loaded and unloaded. No minimum or maximum master gages are required.

X-RAY GAGE—*The Sheffield Corp., Dayton 1, Ohio.* Bearing the name Measuray, these gages have dials by which change-over of thickness setting can be made in less than 5 sec.

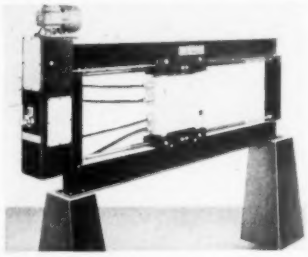


HOB-SHARPENING CHECKER — *Barber-Colman Co., Rockford, Ill.* This instrument inspects hobs and cutters for radialism, flute-to-flute spacing, total spacing, face offset, and accuracy of straight flutes with the axis.

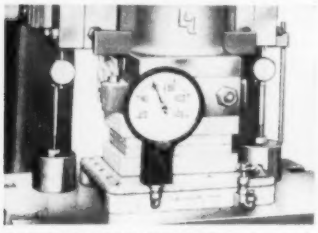
TOOL-CHECKING RECORDER — *Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich.* Model MTR-1 automatic checking recorder has been improved by the addition of a selective two-speed chart drive and an interchangeable precision electronic gagehead.



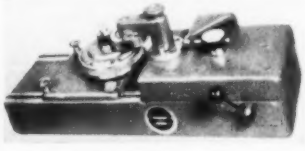
SURFACE CHECKER—*Engis Equipment Co., 431 S. Dearborn St., Chicago 5, Ill.* The Watts 18-in. Auto-Collimator produces parallel rays of light and measures to within ½ sec of arc any deviation between the original direction of the beam and its reflection by the polished surface.



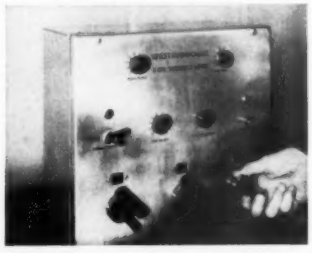
BETA-RAY GAGE—*Pratt & Whitney, Div. Niles-Bement-Pond Co., West Hartford 1, Conn.* A traverse mounting is now available for a beta-ray mill gage which makes it possible to scan and gage the full width of continuous strip material.



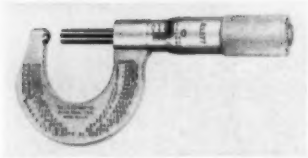
PUNCH-PRESS TESTER — *L. & J. Press Corp., Elkart, Ind.* The L. & J. punch-press tester is a hydraulic device with a recording gage that is placed on the bed to measure the pressure in tons exerted by the ram either directly or through a die.



GEAR-ROLLING INSPECTION—*National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.* Red Ring rolling fixture facilitates loading and unloading the work gear and enables larger and more complicated assemblies to be checked by this method.



THICKNESS GAGE — *Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.* Cold-rolled steel strips ranging in thickness from 0.005 to 0.1196 in. can be measured in steps of 0.001 in. by this X-ray gage.

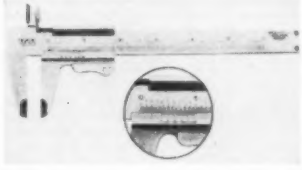


MICROMETER — *The L. S. Starrett Company, Athol, Mass.* Has a rounded anvil which makes it possible to measure to 0.001 in. the wall thickness of tubing.

MICROMETER — *Central Tool Co., Cranston, R. I.* Measurements are determined on a Read-Rite micrometer through numbers which automatically appear in the window on the thimble.

MICROMETERS — *Brown & Sharpe Mfg. Co., Providence 1, R. I.* A few of the major improvements put in this micrometer caliper are: carbide measuring faces, and a large-diameter thimble.

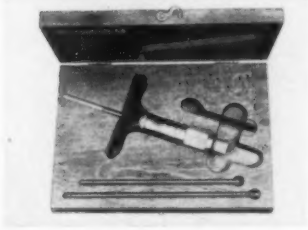
BENCH MICROMETER — *Brown & Sharpe Mfg. Co., Providence 1, Rhode Island.* A micrometer and a dial indicator are combined in the No. 245 indicating bench micrometer. With a capacity from 0 to ½ in., it can be used in three ways: As a micrometer, as a comparator, and as an indicating micrometer.



CALIPERS — *Swedish Gage Co. of America, 8900 Alpine, Detroit 4, Mich.* Tuna vernier calipers are said to be made of best Swedish steel and can measure internal and external lengths as well as depths. Equipped with a spring lock to insure against slipping.

SCREW-THREAD ANALYZER—*Johnson Gage Co., 534 Cottage Grove Road, Bloomfield, Conn.* The screw-thread analyzer provides readings on pitch diameter, and of all of the thread elements affecting the fastening qualities.

HEIGHT GAGE—*The L. S. Starrett Company, Athol, Mass.* The slotted base of the No. 354 vernier height gage permits taking direct readings or scribing lines in any point from the base surface of the tool.



DEPTH GAGES — *L. S. Starrett Co., Athol, Mass.* Line of micrometer depth gages feature: choice of 2½-, 3-, 4-, and 5-in. bases; ranges from 0 to 3-in. or 0 to 6 in., and a locknut to hold settings.

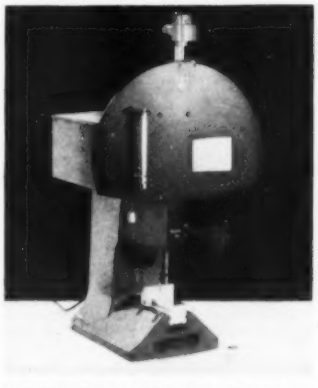
GAGE—*Pratt & Whitney, Div. Niles-Bement-Pond Co., West Hartford 1, Conn.* Critical dimensions of a precision eccentric shaft are checked simultaneously on the Electrolimit gage at a rate of 300 parts per hour. One operator inspects diameters, bearing concentricity, bearing taper, and throw of eccentric in a single operation.

THREAD GAGE — *Hanson Whitney Co., Hartford, Conn.* This gage visually indicates whether threads are oversize, undersize, eccentric, tapered, or if load error exists.

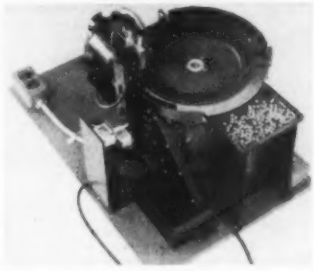
TEST INDICATOR—*L. S. Starrett Co., Athol, Mass.* A swivel friction-holder on the end of the body of this test indicator permits using it in the chuck of jig borers, milling machines, or boring machines.

PORTABLE ULTRAVIOLET LIGHT —*Menlo Research Laboratory, Box 522-BY, Menlo Park, Calif.* For nondestructive testing of objects too large to transport to a backlight booth, the Fluoretor combines portability with a light-tight chamber to exclude light from the area examined.

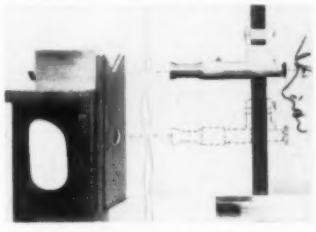
HEIGHT GAGE — *Cadillac Gage Co., 20316 Hoover Rd., Detroit 5, Mich.* 36-in. model rounds out the line of Pla-Chek gages that were introduced five years ago. It is made from hardened-steel bar that contains 36 steps, spaced exactly 1-in. apart.



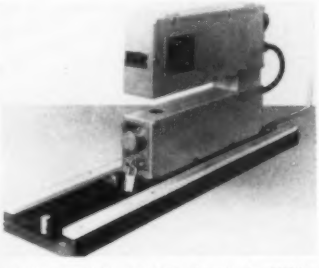
THICKNESS GAGE—*The Bausch & Lomb Optical Co., Rochester, N. Y.* Capable of reading direct to 0.0001-in., this 3-in. thickness gage is designed for accurate, rapid control at production speeds.



THICKNESS GAGE — *Federal Products Corp., 1144 Eddy St., Providence 1, R. I.* Checks small, irregular-shaped disks for thickness. The disks are automatically fed onto the turntable which carries them under the Electricator inspection unit.



HEIGHT-GAGE SCOPE — *Quality Control Co., 6356 Hollywood Blvd., Los Angeles 28, Calif.* Shop inspection instrument has five-power magnification, coated lens, internal focusing, and attaches to any 18- or 20-in. height gage.

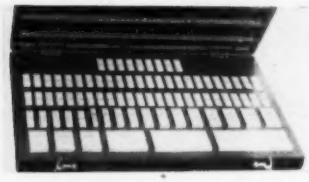


THICKNESS GAGE—*Pratt & Whitney Div., Niles-Bement-Pond Co., Hartford, Conn.* Radioactive isotopes are being used for gaging continuous strip material. The gage used is a beta-ray non-contacting unit.

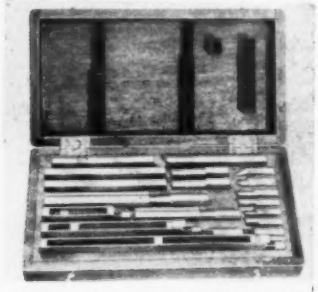
SPLINE GAGES—*MP Tool and Engineering Co., 2339 Caniff Ave., Detroit 12, Mich.* Of the plug and ring type, spline gages can be adjusted like snap gages for different fits, engineering changes, and wear.

DIAL-INDICATOR ANVIL — *L. S. Starrett Co., Athol, Mass.* Converts any standard indicator with solid contact point into an indicator which will be resistant to damage from sudden impact.

AIR-GAGE PLUG—*Pratt & Whitney, Div. Niles-Bement-Pond Co., West Hartford 1, Conn.* A contact-gaging plug for Air-O-Limit internal comparators permits air gaging of rough-surface bores with what is claimed to be a high degree of accuracy.

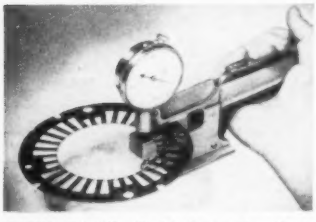


GAGE BLOCKS — *Brown & Sharpe Mfg. Co., Providence 1, R. I.* Johansson gage blocks come in three classes, B ± 0.000008 in., A, ± 0.000004 in., and AA ± 0.000002 in. They can be obtained in working and inspection sets, chromium plated.

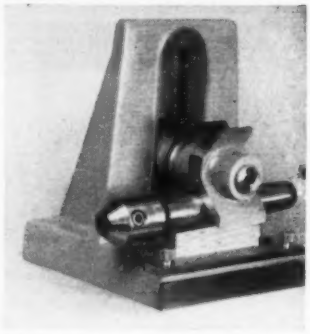


GAGE BLOCK ACCESSORIES—*Jansson Gage Co., 19208 Glendale Ave., Detroit 23, Mich.* Accessory set is said to make possible a variety of additional applications for gage blocks. It includes jaws, straightedges, adjustable holders in various sizes, a center point, and scriber.

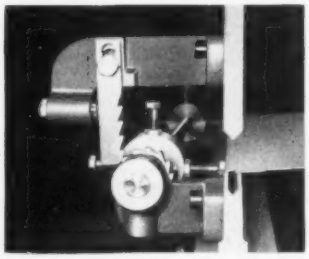
GAGE BLOCKS—*Webber Gage Co., 12900 Triskett Road, Cleveland 11, Ohio.* High wear resistance of the Carblox Thermo-Guard is said to largely eliminate need of periodic checkups. Inlaid in all 1-, 3-, and 4-in. carbide blocks, insulating them from the heat of the hand.



BURR GAGE—*D. C. Ames Co., Waltham, Mass.* Gage is designed to accurately measure the height of burrs in stampings of all materials, and thus determine the wear of punches and dies.



TAPER INSPECTION—*Webber Gage Co., 12912 Triskett Road, Cleveland 11, Ohio.* The Taper-Chek takes less than than two minutes to inspect tools and taper-plug gears to within 0.00002 in. in 4 in. The operator assembles the proper combination of angle blocks which are then mounted with the work, and an indicator reading is taken.



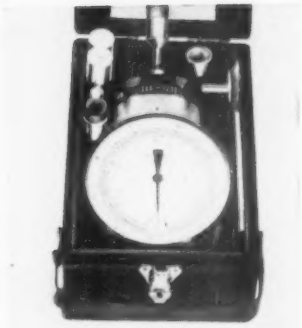
PRESS-BRAKE GAGE—*General Gas Light Co., 202 North Park St., Kalamazoo, Mich.* Self-indexing rotary gage makes possible as many as four different bends in a piece of metal before it leaves the operator's hands. Th gage consists of a rack-and-gear assembly which automatically rotates adjustable gage stops into position and holds them securely until bend has been made.

THREAD GAGE—*O-Vee Spring Gauge Company, Los Angeles, Calif.* Based on the three-wire method of thread measurement, this device is said to overcome the limitations of ring gages by indicating the actual size of the thread.

VERNIER CALIPERS — *Transocean Trading Co., 1511 N. Gardner, Los Angeles 46, Calif.* Vernier calipers from Sweden now available here give positive accuracy to 0.001 in. for outside, inside, depth, and thread measurements from 0 to 6 in.

CRANKCASE-OIL TESTER — *Photovolt Corp., 95 Madison Ave., New York 16, N. Y.* This photoelectric tester is designed to measure the light transmission of a thin layer of oil as an indication of its degree of contamination by carbon, metal, and other particles.

CONTOUR-MEASURER — *Measuring Machines, Inc., 20350 Center Ridge Road, Cleveland 16, Ohio.* Blades, cams, dies, and odd shapes are checked for contour in a matter of minutes on the Vizo-Graf measuring machine. Measurements are recorded for comparison with the original blueprint.

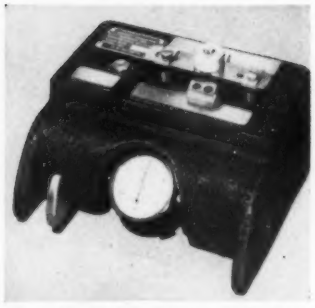


TACHOMETERS—*O. Zernickow Co., 18 Park Row, New York 7, N. Y.* The dial of these tachometers has a diameter of 3 in. and a long, open scale, easy to read. The pointer has a knife edge so that one can read between lines.

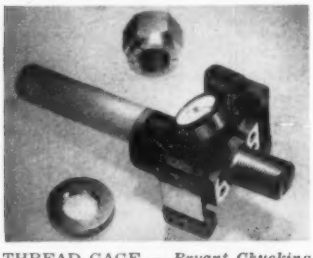
TACHOMETERS — *The Herman H. Sticht Co., Inc., 27 Park Place, New York 7, N.Y.* Model JP hand tachometer has a 3-in. dial covered by a plastic lens which is said to prevent breakage and make the instrument suitable for rough-service work.

ELECTRONIC TACHOMETER—*Potter Instrument Co., Inc., 115 Cutter Mill Road, Great Neck, N. Y.* For high-accuracy revolution and frequency measurements. It totalizes the number of counts from the source during a precisely established time interval of 0.6 sec.

MATERIAL STOP—*The Mahl Equipment Co. Div., Standard Iron and Fire Works, Inc., 2930 N. 2nd Street, Minneapolis 11, Minnesota.* The Mule Gage provides shock-absorbing action when heavy iron pieces are thrust against it, recoiling with each cutting or shearing thrust, and then return.



THREAD GAGE — *Bryant Chucking Grinder Co., Springfield, Vt.* No. 11 thread gage uses the principle of interchangeable segments so that wide range of internally or externally threaded parts can be checked on the same basic gage.

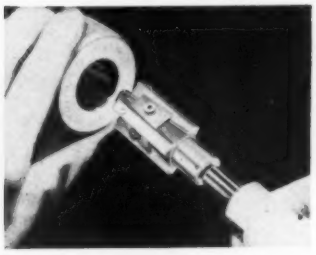


THREAD GAGE — *Bryant Chucking Grinder Co., Springfield, Vermont.* Redesigned model of portable internal thread gage weighs 14 oz., half the weight of the former gage. It is used for inspection of internal threads in a range from 5/16 to 1 in., either National Coarse or National Fine.

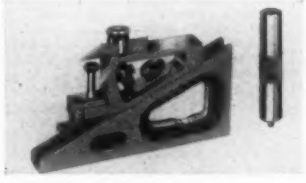
TITANIUM THREAD GAGE—*Republic Gage Company, Detroit 21, Mich.* The Titan is said to check male threads with gage wear reduced to a negligible amount. The ring is of the insert type with knurled aluminum collar.

VIBROMETER—*The Vibroscope Co., 6 East 39th St., New York 16, N. Y.* The Model-P vibrometer is applied by holding it manually against the machine to be checked. The width of oscillation of the light beam on a graduated ground-glass scale indicates the vibration amplitude.

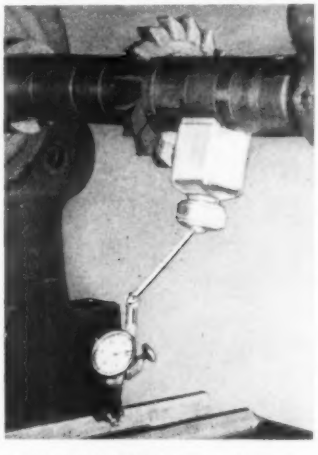
BALL BEARING GAGE — *Sheffield Corp., Dayton 1, Ohio.* Radial internal clearance of ball and roller bearings can be accurately measured on a production basis.



GAGING SPINDLES — *The Sheffield Corp., Dayton 1, Ohio.* Adjustable spindles are of the ball-jet contact type, and are available in either through-hole or blind-hole styles. They will measure internal diameters from one to three inches inclusive.



PRECISION GAGE—*The L. S. Starrett Co., Athol, Mass.* Universal precision gage has quick adjustment of the knurled thumbscrew setting the gage to the exact size required, either from a micrometer height gage, vernier caliper, or gage blocks.



TEST INDICATOR—*Enco Mfg. Co., 45222-24 W. Fullerton Ave., Chicago 39, Ill.* The Miti-Mite is a magnetic-base holder for test indicators or Handi-Lites which can be mounted on any iron or steel surface, either round or flat.

INTERNAL SPLINE GAGE—*Nilsson Gage Co. Inc., 2A Lake St., Poughkeepsie, N. Y.* By removing the centralizing unit, which is not an integral part of the gage, the standard Nilco dial bore gage can be converted into an internal spline gage.

SPLINE CHECKER—*MP Tool and Engineering Co., 2339 Caniff Ave., Detroit 12, Mich.* A combination of adjustable, self-centering teeth in conjunction with dial indicators provide a gear-and-spline portable comparator for checking internal teeth.

BALL BEARING GAGE—*The Sheffield Corp., Dayton 1, Ohio.* A process gage as well as an inspection instrument, the Selectionnaire tells, before assembly, exactly how much space would be left between the inner and outer races of the balls.

HAND TACHOMETER — *Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.* The Type-25D hand tachometer has speed-measuring ranges of: 100 to 1000, 200-2000, and 500-5000 rpm and fpm; and 10-100, 20-200 and 50-500 fpm.

DIAL COMPARATOR — *The L. S. Starrett Co., 101 Crescent St., Athol, Mass.* The 653 dial comparator is designed for use in toolrooms and machine shops on a wide variety of applications.

MAGNETIC BASE — *The duMont Corp., Greenfield, Mass.* The "Minute Man" magnetic base is for quick application of dial-indicator gages and other tools, and may be used for either round or flat surfaces.

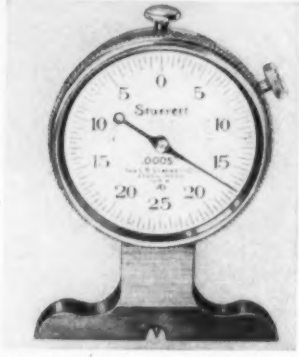
THREAD PLUG GAGES—*Size Control Co., 2500 W. Washington Blvd., Chicago, Ill.* Reversible carbide plug gages are offered in all sizes from No. 5 to 40 NC, NF, NEF, and special sizes. Hardness of material and accuracy of the gages are claimed to virtually eliminate gage-makers' wear allowances.

HAND TACHOGRAPH—*O. Zernickow Co., 15 Park Row, New York 7, N. Y.* Has a quintuple selective range and a rotating gear shift. Made in three different range combinations for speeds of 30-48,000 rpm, 15-24,000 fpm.

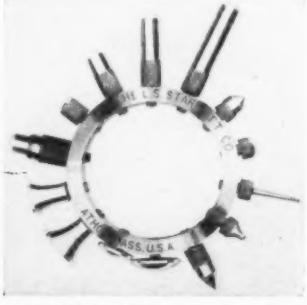
DIAL INDICATOR—*Chicago Dial Indicator Co., Dept D, 180 N. Wacker Drive, Chicago 6, Ill.* These instruments are said to be accurate because a lever arm is used instead of a multiplicity of gears in the movement.

DIAL INDICATOR—*Federal Products Corp., 114 Eddy St., Providence 1, R. I.* The hand of these "B" and "C" size dial indicators is designed with the weight of the pointing end counterbalanced by a short weighted section on the opposite end.

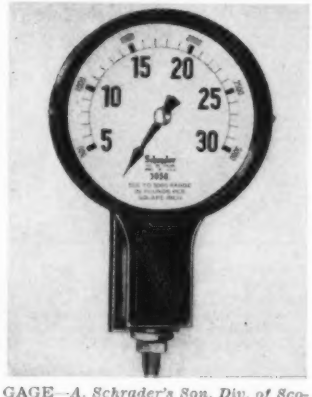
DIAL GAGES — *Standard Gage Co., Inc., Poughkeepsie, N. Y.* The Dializer is a device which converts American Gage Design adjustable-limit snap gages into dial instruments. It is inserted in place of two gaging pins and is adjusted by means of a knurled nut.



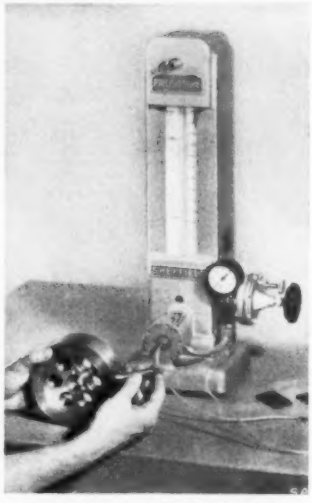
DIAL GAGE—*The L. S. Starrett Co., Athol, Mass.* Small holes, recesses, and slots which are too small for ordinary depth gages can be measured with a new dial gage that is equipped with a knife-edge base 2½-in. long and a needle-point rod.



POINT SELECTOR—*The L. S. Starrett Co., Athol, Mass.* The selection offered by the Dial-Indicator point selector includes 14 standard and special points, all of which have 4.48 mounting thread to fit any standard American Gage Design indicator.



GAGE—*A. Schrader's Son, Div. of Scovill Manufacturing Co., Inc., Brooklyn 17, N. Y.* The Hydrodial gage has a circular dial, readable at 50 ft, and is provided with built-in snubber and plastic face. Built on a direct acting shock-resisting principle.



FINISH GAGE—*The Sheffield Corp., Dayton 1, Ohio.* Used for the comparison of surface finishes on flat or curved pieces having a diameter greater than 3½ in. The reading measures the escapement of air over a circle of ⅛-in. diam.

DIAL SNAP GAGE—*Nilsson Gage Co., Inc., 2A Lake St., Poughkeepsie, N. Y.* External spline gage uses hardened rolls on the upper and lower anvils and a lifting lever which will depress the lower anvil to clear the OD of the spline or gear.

DIAL INDICATOR—*Pacific Machine Tool Co., 1432 Grove St., Oakland 12, Calif.* A nylon cord replaces the gear train of the Pacific dial indicator. The spring and nylon construction cushions all movements caused by rough work or rapid variations in either direction.

DIAL DEPTH GAGE—*L. S. Starrett Co., Athol, Mass.* The flat base of the No. 644 dial depth gage is positioned on the top surface of the work to be measured, allowing the rod to enter the hole or recess to its full depth.

DIAL BORE GAGE—*Rimat Machine Tool Co., 1117 Air Way, Glendale 1, Calif.* Diameters of internal grooves for O-ring, snap rings, oil rings, and straight bores are measured with minimum-skill by this gage. Standard tip sizes are 1/16- and ⅛-in. OD.

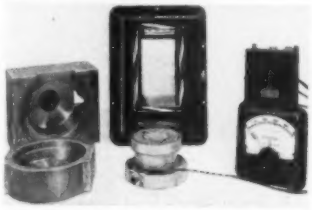
HAND GAGE—*The L. S. Starrett Company, Athol, Mass.* Gage No. 1015 is held by means of finger holes and operated by pressing a thumb lever which raises the spindle. Contact pressure is independent of the operator.

DIAL BENCH GAGE—*The L. S. Starrett Co., Athol, Mass.* Small parts are inspected rapidly with a No. 652 universal. Indicator readings are accurate to five tenths. For use as a comparator or a thickness gage.

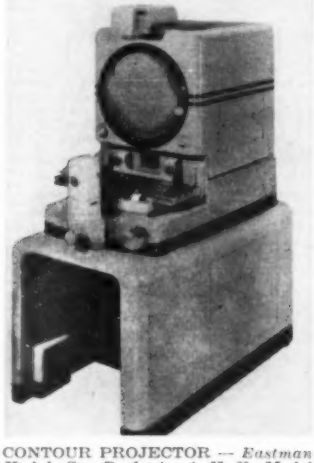
CRANE SCALES—*Hydroway Scale, Inc., 20624 W. Eight Mile Road, Detroit 19, Mich.* An impact-resistant dial glass that eliminates need for protective metal guards has been incorporated in hydraulic crane scales.

DIAL CENTER FINDER—*Waltham Dial Gage Co., Stowe, Mass.* Rigidly constructed yet sensitive indicator for locating work pieces on jig borers, milling machines, radial drills, or lathes.

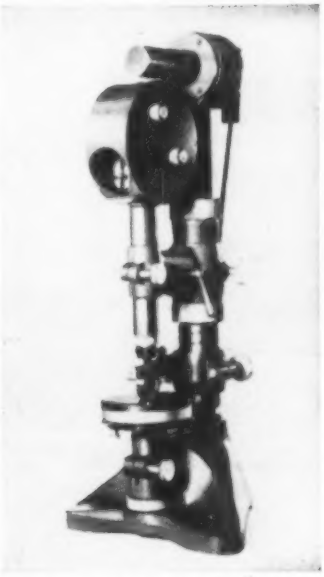
GAGE—*Nilsson Gage Co. Inc., Poughkeepsie, New York.* For quality-control inspection, the Dial Groove gage measures internal groove diameters and recesses used for precision retaining rings of the Truarc type, ordinary snap rings, O-rings, and oil and washer grooves.



GAGE—*Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford 1, Conn.* Electrolimit pressure gage blocks are mounted on the mill housing between the top bearing and the screw, or between the bottom bearing and the housing.



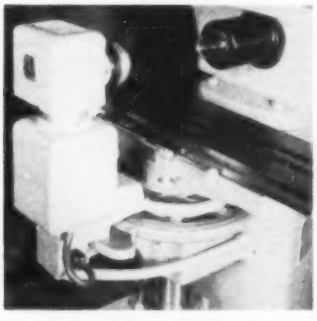
CONTOUR PROJECTOR — *Eastman Kodak Co., Rochester 4, N. Y.* Model 2 is an optical comparator providing 14¾ in. of work space between lamphouse and lens, regardless of magnification.



OPTICAL COMPARATOR — *George Scherr Co., Inc., New York 12, N. Y.* The optical scale on the Leitz Opti-Comparator has a total range of 10 thousandths of an inch, divided into 200 parts of 50 millionths each. The unit embodies a measuring pressure adjustment from 2 to 7 oz.

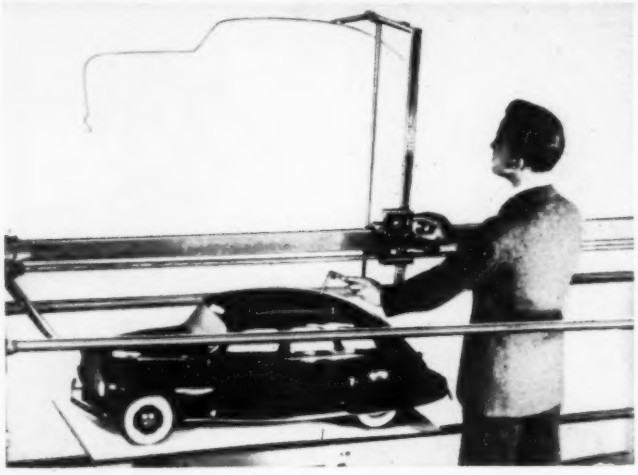
SMALL COMPARATOR — *National Tool Co., 11200 Madison Ave., Cleveland 2, Ohio.* Optical measuring instrument for the inspection of small parts. Through a magnifying lens the user may compare the part to be checked against a finely calibrated pattern or reticle.

OPTICAL COMPARATORS—*Jones & Lamson Machine Co., Springfield, Vt.* A single lever on this motor-drive unit for raising or lowering the work table of the J & L pedestal type comparators gives the operator control of rapid-acting vertical traverse.

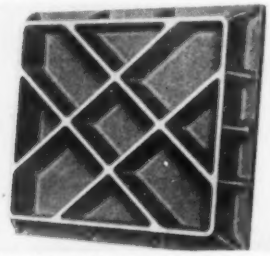


OPTICAL COMPARATORS—*Jones & Lamson Machine Co., Springfield, Vt.* Providing increased screen illumination, particularly at high magnifications, these illuminators are supplied on Models DC-14, PC-14 and PC-30 optical comparators.

LAYOUT and INSPECTION—Optical and Layout Equipment

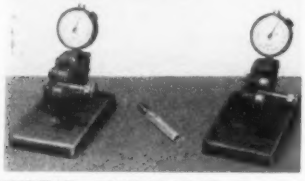


DUPLIGRAPH—*InterLakes Engineering Co., 4745 Bellevue, Detroit 7, Mich.* Through the use of an instrument called a Dupligraph, it is possible to reproduce on paper the exact contour of irregular surfaces in a fraction of the time required by the former method of cutting and fitting wood templets.

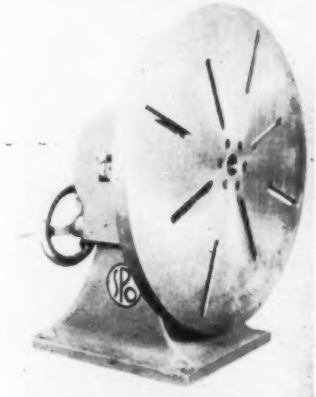


SURFACE PLATE—*Delta Power Tool Div., Rockwell Mfg. Co., Milwaukee 1, Wis.* The plate is a heavy-ribbed casting to insure that the surface stays true. There is a clamping ledge to which angle plates and vises can be attached.

SHOP MICROSCOPE—*Boeckeler Instrument Co., 31 E. Rillito St., Tucson, Arizona.* All functions of linear coordinate and angular measurement can be performed on the Boeckeler Model 1, measuring microscope. Range of measurement is 6½ in.



THREAD COMPARATOR—*Pratt & Whitney, Div. Niles-Bement-Pond Co., W. Hartford, Conn.* Externally threaded parts to be measured on the Tri-Roll are cradled between two stationary gaging rolls and a third roll, mounted on a preloaded armature, is swung into contact.



LAYOUT TABLE — *SPO Inc., 6430 Grand Division Ave., Cleveland 5, Ohio.* Using a 30-in.-dia rotary table, the Series No. 30 utilizes an indicator and vernier on an adjustable arm to permit direct readings, accurate to within ten minutes.

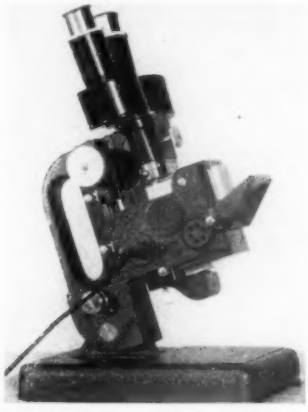
UNIVERSAL MONOCHROMATOR—*Perkin-Elmer Corp., Glenbrook, Conn.* When suitable prisms or gratings are used, Model 83 Monochromator covers the ultra-violet, visible, and infra-red regions of the spectrum (0.18 microns to 40 microns). This unit is the essential part of any spectrophotometer.

COUNTER — *Abrams Instrument Corp., Lansing 1, Mich.* Measuring 1-in. high, less than 2 in. deep, and weighing two oz, these three- and four-digit precision counters can add or subtract, recording a maximum of 1200 counts per min.

OSCILLOGRAPH-RECORD CAMERA —*Allen B. DuMont Laboratories, Inc., Clifton, N. J.* Provides a finished print in one minute. No dark-room facilities are required.

SHOP MICROSCOPE — *Buhl Optical Co., 1009 Beach Ave., Pittsburgh 12, Pa.* Designed for checking close work under rough shop conditions, Model S-186 is a 20-power wide-field microscope. It is intended for checking castings, machine threads, surface finishes, welds, raw materials, and fibers.

PARALLELS—*Bahn Granite Surface Plate Co., 1149 Platt Circle, Dayton 7, Ohio.* Precision parallels are made of black granite (diabase) to a claimed over-all tolerance of 0.00005 in. in a set. Original accuracy is said to be maintained indefinitely because of hardness of the granite.



COMPARISON MICROSCOPE — *George Scherr Co., 200 Lafayette St., New York, N. Y.* Leitz microscope checks machined surfaces for quality of finish. A sample piece having the approved finish is placed on one stage while the work is placed under the objective below.

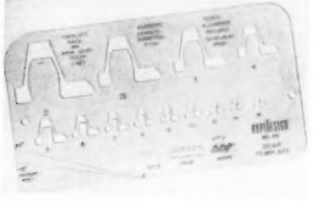
METALLOGRAPH—*American Optical Co., Instrument Div., Buffalo, N. Y.* Designed as a routine control instrument, this metallograph has all the controls and adjustments within easy reach.

QUALITY INDICATOR — *General Electric, Schenectady 5, N. Y.* This quality control indicator counts the number of items produced and the number of rejects. If rejects rise above a predetermined rate, a needle on the meter moves to the right, calling attention to trouble spot.

ULTRA-VIOLET LAMPS—*Stratex Instrument Co., Inc., 1861 Hillhurst Ave., Los Angeles 27, Calif.* Available in wave lengths, short (2537 Angstrom units) and long (3660 Angstrom units). The joint cost of both lamps is considerably less than the cost of one lamp of a year ago.

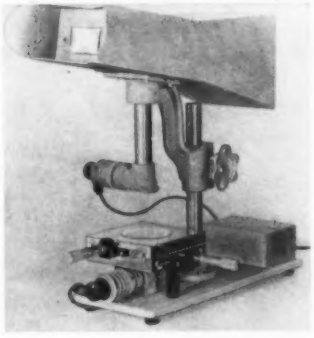
ELLIPSE TEMPLET — *Rapidesign Inc., P. O. Box 592, Glendale, Calif.* No. 78 Ellipse Master has ellipses in projections of 20, 30, 40 and 30 deg. Sixty ellipses are arranged in sizes from ⅛ to 1⅝ in.

MAGNIFIER — *Industrial Products Co., 2652 N. Fourth St., Philadelphia 33, Pa.* Built for workers engaged in close work, this magnifier is equipped with fluorescent lighting said to flood-light the work area with focused shadow-free light.



GEAR TEMPLET — *Rapid Design, Inc., Box 952, Glendale, Calif.* No. 80 can be used for drawing involute, rack, and spur gear teeth and 29° worm gears.

METALLURGICAL MICROSCOPE — *William J. Hacker & Co., Inc., 82 Beaver St., New York.* This microscope with built-in camera is said to be compact and easy to operate.



OPTICAL MEASURER—*Stocker and Yale, Marblehead, Mass.* Primarily intended as a measuring instrument it also provides contour and front-surface projection. For measuring, readings can be taken in increments of 0.0001 in. in two planes at 90° angles.

FRACTION SCALE—*Charles E. Wells, P. O. Box 25, Montrose, Calif.* Fractions can be quickly added or subtracted by using a circular scale. The device, known as the Fractionator, consists of three disks.

ADJUSTABLE-HOLE LOCATORS—*MP Tool & Engineering Co., 2339 Caniff Ave., Detroit 12, Mich.* Operated by MP adjustable involute teeth, evenly spaced pins on this hole locator adjust themselves to varying sizes of holes, accurately centralizing parts for checking faces and diameters in relation to the holes.

LAYOUT FLUID—*The Dayton Rogers Mfg. Co., Minneapolis 7, Minn.* Marking fluid which produces a dark background for all layout work is offered in 4-oz., 1-pint, 1-quart, 1-gal., and 55-gal. containers.

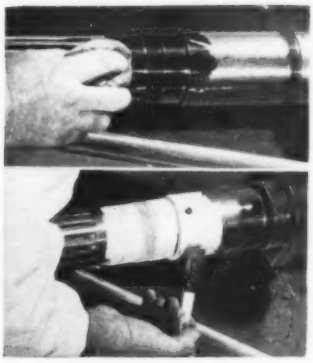
CALCULATOR—*The Taft-Pierce Mfg. Co., Woonsocket, R. I.* Slide calculator provides a rapid and convenient means of obtaining standard thread-plug and ring-gage dimensions under the new Unified and American screw-thread standards.

MAGNIFIER—*The Miller Co., Waseca 1, Minn.* Consists of a powerful glass mounted on a sturdy supporting post to which is attached a high-strength Alnico magnet. Typical application is in clarifying the hundredths scale of a machinist's rule.

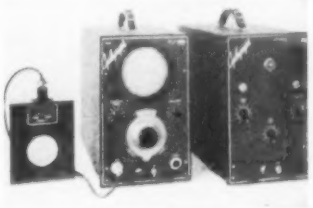
PLASTIC SCALE MODELS—*Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Pa.* Cut into three-dimensional shapes, enabling engineers to get a color portrait of the strains encountered in tools, machine parts, and other objects.

SLIDE CALCULATOR—*The Elemoto Sales Co., Teaneck, N. J.* When the slide inside the housing is moved to the right or left, standard dimensions for each thread size from No. 0 to 4 in. are read in windows.

COMPASS—*Borden & Riley Paper Co., New York, N. Y.* Known as the Circle Master, has knee joints which can be quickly and easily adjusted.

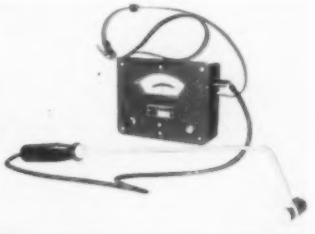


DYE PENETRANT — *Dy-Check Co., Hawthorne, Calif.* A general-purpose process for quick detection of surface cracks and flaws requires only a paint brush, spray booth, or dip tank. The key is a liquid of unusually high capillary action and correspondingly low surface tension. It contains a brilliant red dye in a super-saturated solution.



SORTER—*J. W. Dice Co., 1 Engle St., Englewood, N. J.* A magnetic principle is employed by the Cyclograph to rapidly sort by analysis of the part, structure, hardness, case depth, brittleness, or almost any metallurgical difference.

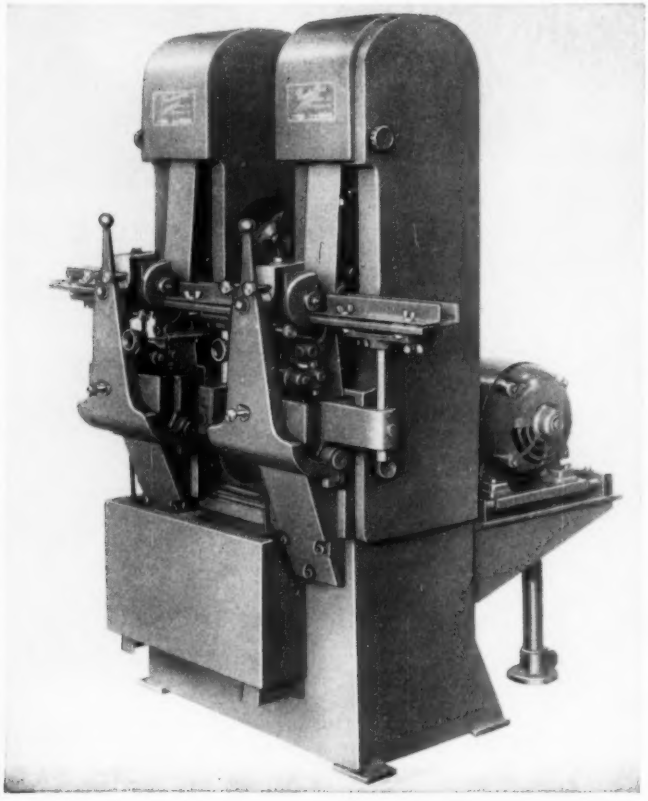
STEEL SEPARATOR — *Jones and Laughlin Steel Corp., Pittsburgh 30, Pa.* The Steelsorter offers an answer to the ever-present problem of segregating different chemical composition or grade. It separates semi-finished and finished steel products that have become mixed.



TIN-CONTENT INDICATOR—*Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.* Portable indicator gives a direct reading of the tin content up to 7% in solder. The test requires a few seconds and eliminates sending samples to a laboratory.

AMERICAN MACHINIST 1951 PRODUCTION PREVIEW

Cleaning and Finishing

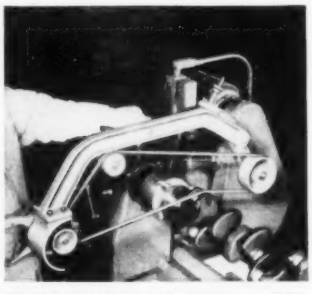


POLISHING MACHINE — *Production Machine Co., Greenfield, Mass.* Centerless polishing and finishing machine is designed to operate under continuous production loads. It will handle cylindrical work up to 1½-in. diameter of limited weight, either straight or tapered.

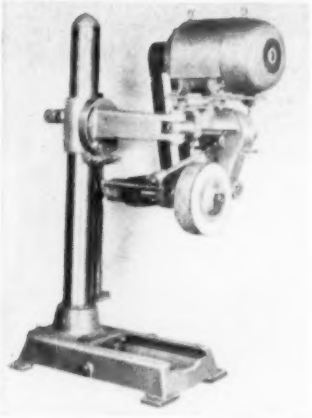
POLISHING PAD—*Roline, Inc., Cleveland, Ohio.* The flexible rubber Sandanser, hand sanding and polishing pad is such that heel rest, handle at back, and finger pocket, direct all energy to block and protect fingers.

BUFFING COMPOUND—*Hanson-Van Winkle-Munning Co., Matawan, N. J.* Designated as No. 4-S-10, it is said to be easily cleaned off after polishing. Aqueous solutions using a mild alkaline cleaner will do the job.

POLISHING BELT — *The Industrial Lubricants Co., Inc., 14459 Wildemere, Detroit 6.* Lasts for more than 1,000 setups, suffers no raveling, has negligible stretch or shrinkage.



CRANKSHAFT POLISHER — *Tillis Mfg. Co., Elkhart, Indiana.* Constructed of aluminum alloys of high tensile strength, this portable crankshaft polisher can be operated manually and can be adapted to overhead suspension using counterweight balance.

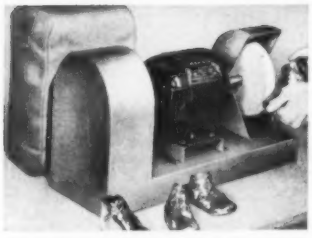


POLISHING HEADS — *Murray-Way Corp., Detroit, Mich.* Available in two standard sizes: No. 61, rated at 10 to 15 hp and the No. 62 rated at 5 to 7½ hp. The heads will operate either right or left hand, without extra brackets or extensive mechanical adjustment.

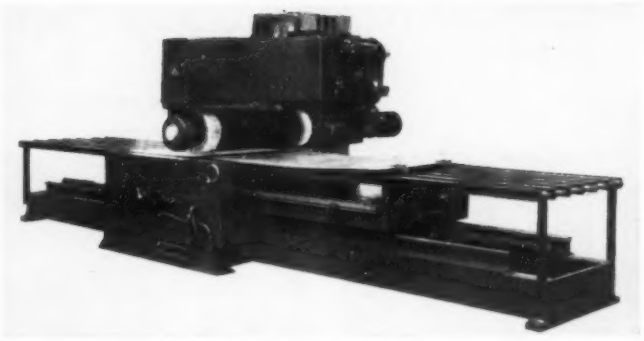
ABRASIVE — *Ideal Industries, Inc., Park Ave., Sycamore, Ill.* Fine-grain abrasive material is held together by a flexible bond and molded in stick form for cleaning and polishing metals.

POLISHING MACHINE — *Vonnegut Moulder Corp., Indianapolis, Ind.* The underslung-spindle design of this unit is said to provide unusual rigidity in the relatively long, thin spindle. With this construction neither depth nor width of the overarm need be restricted.

DEGREASER — *Optimus Equipment Co., Matawan, N. J.* The strong, flushing action of clean solvent is combined with a vapor phase in this degreaser.



POLISHING UNIT—*Warner Electric Co. Inc., 1512 W. Jarvis Ave., Chicago 26, Ill.* Bench-size buffing and polishing unit is designed for electroplaters and other metal-finishing applications. A built-in dust collector exhausts through a filter bag.



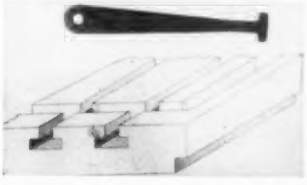
SHEET-BUFFING MACHINE — *The Hill Acme Co., Cleveland, Ohio.* Has hydraulic table and power elevating and lowering head for 18-in.-dia buffing roll or Tampico brush roll. Oscillating mechanism is powered by 3-hp motor and has stroke variation from ½ to 2 in. and range of 50 to 150 cycles per min.

POLISHER—*The Van Dorn Electric Tool Co., Towson 4, Md.* For intermittent service in small shops and garages the 7-in. Junior Polisher has a cast-aluminum housing and weighs 8 lb. The polisher is equipped with a spindle-locking pin for fast changing of bonnets and pads.

BLAST CLEANING MACHINE—*The W. W. Sly Mfg. Co., 4700 Train Ave., Cleveland 2, Ohio.* For abrasive blast cleaning of small parts, this portable bench cabinet operates on compressed air supplied by standard 5-hp two-stage garage compressor.

DEGREASER—*Detrex Corp., Detroit 32, Mich.* A degreaser with a rotary internal conveyor for the handling of work through a vapor-spray-vapor or a vapor-immersion-vapor cleaning cycle.

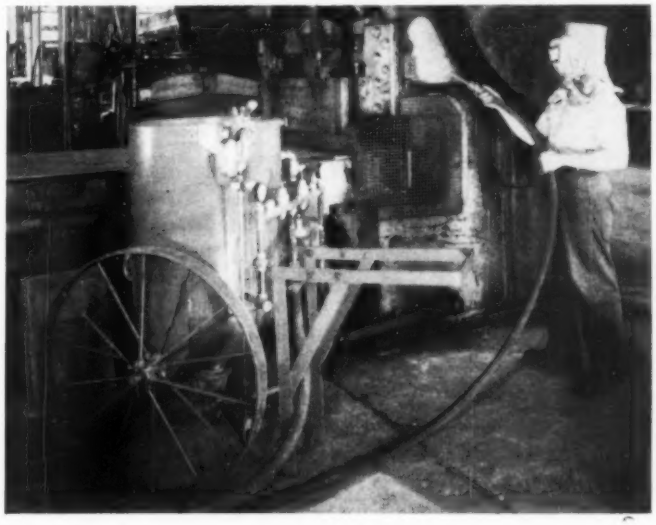
ABRASIVE KIT—*Industrial Products Div., Elgin National Watch Co., Elgin, Ill.* For experimental and development work, this kit contains six most widely used Bureau-of-Standard grades of Dymo diamond compound.



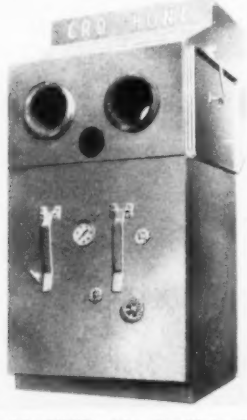
SLOT CLEANER — *Dayton Rogers Mfg. Co., 2824 Thirteenth Ave., South, Minneapolis 7, Minn.* All-steel rustproof machine-tool slot cleaner has an over-all length of 8 in. and is made from 0.125-in. strip steel. The tool is sent free upon request on company letterhead.

METAL CLEANSER—*Glyco Products Co., Inc., 26 Court St., Brooklyn 2, N.Y.* Di-phase metal cleaners are used in a system in which the water and solvent remain as separate layers. The cleaner consists of a chlorinated solvent such as trichlorethylene to which is added mineral spirits.

PORTABLE BLAST MACHINE — *Pangborn Corp., Hagerstown, Md.* Using finely-ground corn cobs as an abrasive it is used for air-blast cleaning, degreasing, and reconditioning of armatures, motors, machinery and plant equipment.



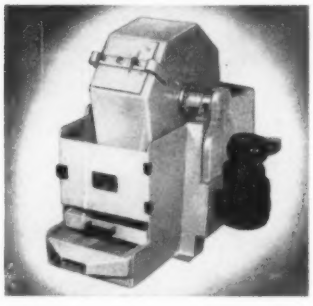
BLAST-CLEANING — *Pangborn Corp., Hagerstown, Md.* Hydro-finishing is a modified form of impact blasting using an abrasive, suspended in liquid, which is delivered to the blasting nozzle by means of a circulating pump.



WET BLASTER—*The Cro-Plate Co., Inc., 3343-47 Main St., Hartford 5, Conn.* 600-cfm blower on the Cro-Hone cabinet assures clear vision by removing the abrasive vapors at the worktable level, instead of evacuating from the top.

COPPER-CLEANING SHOT — *Harrison Abrasives Div., Metals Disintegrating Co., Inc., Elizabeth, N. J.* L/D copper-cleaning shot cleans the casting by the force of its impact, and does not imbed itself. The shot is made from copper wire in the form of cylinders.

BLUE CONCENTRATE — *The Miskella Infra-Red Co., East 73rd and Grand Ave., Cleveland 4, Ohio.* When used to replace ordinary water for rinsing metal and other solid materials, blue concentrate shortens the drying time and materially reduces the heat needed.



DEBURRING BARRELS—*Belke Mfg. Co., 945-57 N. Cicero Ave., Chicago 51, Ill.* The barrel for this small-lot tumbling unit is rotated by an enclosed variable-speed drive which permits adjustment to any rotating speed between 13 and 39 rpm.

BRUSH — *Skilsaw Inc., 5033 Elston Ave., Chicago 10, Ill.* On the Skil Flex wire brush, the resilient rubber mounting holds wire securely, reducing the danger of flying bristles.

CLEANING SOLVENT — *Chemclean Products Corp., 64 Sixth Ave., New York 13, N. Y.* Of the self-emulsifying type, it is claimed to be fast wetting, rapid penetrating, and to have rinsing properties that insure wetting of deep recesses.

WASH SOLUTION—*Turco Products, Inc., Los Angeles, Calif.* Acid-cleaning with Turco 1620 process does three things at once: removes soil and dirt, provides a good paint bond, and inhibits rust.

METAL CLEANER—*Regal Air Corp., New York, N. Y.* Available in the form of impregnated pads. The pads are said to be reusable until worn out, without diminution of their effectiveness.

ABRASIVE COMPOUND—*Industrial Products Div., Elgin National Watch Co., Aurora, Ill.* Dymo compound for finishing is composed of crushed, graded, and cleaned pure virgin diamond, held in a vehicle said to provide stability up to 150 F.

POROSITY ELIMINATION—*Tincher Products Co., 861 Borden Ave., Sycamore, Ill.* High-pressure equipment permits a bulk porosity-elimination treatment of small cast parts. No evidence of impregnation remains after the treatment—which does not require washing or curing.

SAND-BLAST HELMET — *Willson Products Inc., Reading, Pa.* Helmet for protection against dust and abrasives in sand-blasting operations weighs only 6 lb. A perforated tube, supplying air at the top of the helmet, eliminates need of a separate face mask.

DEGREASER — *Circo Products Co., 6531 Euclid Ave., Cleveland 3, Ohio.* Available in either nickel-clad, stainless-clad or zinc-sprayed construction, the C-120 degreaser has a vapor depth of 84 in., inside length is 96 in., and width 60 in.

POLISHING HEAD—*Hammond Machinery Builders, 1600 Douglas Ave., Kalamazoo, Mich.* Universal adjustment for any angle position within 120° arc is obtained through slide and pivot adjustments on the Model 6120 abrasive-belt head.

STEAM JET CLEANER—*Livingstone Engineering Co., 100 Grove St., Worcester 5, Mass.* The Speedelectric cleaner JC-30 delivers high-pressure steam and cleaning agent through separate hoses to a steam lance. Here solvent or detergent is atomized, mixed with the steam, and sprayed at high speed.

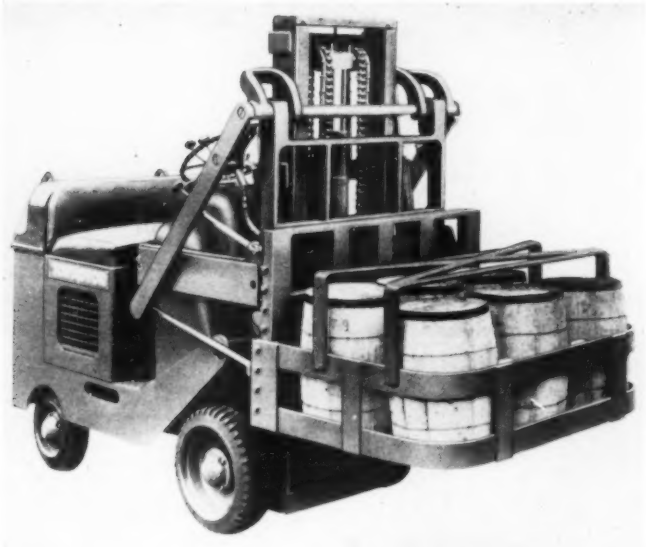
SPRAY BOOTHS — *Newcomb-Detroit Co., 5741 Russell, Detroit 11, Mich.* Have a flood sheet which permits intake of paint-laden air through the water curtain increasing the amount of intake area.

OILPROOF ENAMEL—*Irvington Varnish and Insulator Co., 6 Argyle Terrace, Irvington 11, N. J.* Known as No. 32, it dries to hardness in eight hours. For electrical service, it has a dielectric strength of 800 volts per mill.

AGITATOR — *Graymills Corp., Evanston, Ill.* A heavy-duty parts-cleaning unit called the Model 878 Agitor, holds 50 gal. of solvent, and will handle large stock.

TUMBLING MATERIALS—*Kube-Kut, Inc., 635 Midland Ave., Garfield, N. J.* Excellent finishes for metals, plastics and similar materials are claimed as a result of processing with a tumbling material made of different grades of hard maple or corn-cob granules.

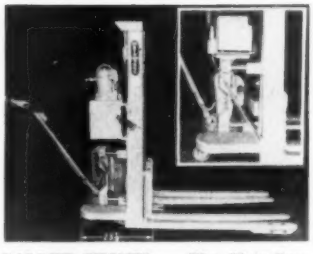
Plant Service Equipment



KEG TRUCK—*Towmotor Corp., 1226 E. 152nd St., Cleveland, Ohio.* Keg-handling device on truck picks up, transports, stacks and unloads six 200-lb kegs of material in a single maneuver.

POWER TRUCK — *Elwell-Parker Electric Co., Cleveland, Ohio.* Power-truck lifting device for drums consists of a steel frame with base attached to the elevating mechanism in the truck's upright column.

BURDEN CARRIER—*Lewis-Shepard Products, Inc., 262 Walnut St., Watertown, Mass.* The ToteMaster Model GC 2-56 is a carrier with a 2000-lb capacity. It has 21 sq-ft of loading space. Powered by a 20-hp, 4-cylinder, watercooled engine, it is governor controlled for speeds up to 20 mph.



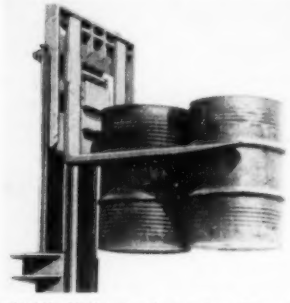
PALLET TRUCK — *The Moto-Truc Co., Cleveland, Ohio.* This Shortie Model is 10-in. shorter than the preceding types. This has been accomplished by mounting the battery above the motor-drive unit.

LIFT TRUCK—*Hyster Co., 2902 N.E. Clackamas St., Portland 8, Oregon.* Powered by a Wisconsin air-cooled engine, Model 20 will handle loads up to 2000 lb. Among the changes in the engine, are a new intake manifold, redesigned shrouds which pull air from the sides of the machine, a new electric fuel pump, and a new distributor.

FORK-LIFT TRUCK — *Transitier Truck Co., Portland, Ore.* This fork-lift truck called the Hi-Duty has a 64-in. turning radius and yet is able to handle loads in the 3000-lb bracket. →

ELECTRIC TRACTOR—*Mercury Manufacturing Co., 4114 S. Halsted St., Chicago, Ill.* Four-wheel drive and four-wheel steer are provided on the Model A-800-3 industrial tractor. Electrically driven by two motors, it develops a maximum tractive effort of more than 4000 lb.

FORK TRUCK—*Lewis-Shepard Products, Inc., 261 Walnut St., Watertown 72, Mass.* Compact design and proper distribution of weight combined with rearwheel drive allow the JFTT fork truck to right-angle stack in narrow aisles.



DRUM FORKS—*Towmotor Corporation, Cleveland, Ohio.* All ordinary pallet fork operations, plus the handling of steel drums without pallets can be accomplished with the hydraulic drum forks.

LIFT TRUCK—*Automatic Transportation Co., 149 W. 87th St., Chicago, Ill.* Design changes in 12 models of the Skylift (BF) electrical industrial trucks are said to provide longer life, reduced maintenance, and superior performance.

FORK TRUCK—*Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.* Battery-powered Trucloader 1000-lb fork-lift truck provides automatically accelerated control.

FORK TRUCK—*Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.* Reduced over-all width and increased speed are among the features of a 3000-lb-capacity electric Carloader.

SHOP LOCOMOTIVE—*Whiting Corp., Harvey, Ill.* The gasoline-powered Trackmobile can be used on the ground or on tracks. A hydraulic feature enables the unit to develop a drawbar pull of 7350 lb in low gear.

FORK TRUCK—*Yale & Towne Mfg. Co., Roosevelt Blvd., Philadelphia 15, Pa.* The Yard King pneumatic-tired fork lift truck is for use on rough terrain. An inclined kingpin provides easy steering and protects the steering gear against road shock.

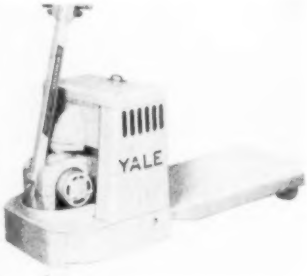
FORK TRUCK—*Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.* Clark fork-lift trucks are being equipped with Dynatork drive, which transmits engine power to the drive wheels by magnetic induction, through an air gap.

LIFT TRUCK — *Market Forge Co., Everett, Mass.* Made of aluminum alloy, has wheels that automatically retract when the forks are in a lowered position.

SHOP-BOX TRAILER—*Palmer-Shile Co., Detroit, Mich.* Of corrugated design, has trunnions with a yoke for quick unloading two stationary wheels, and two swivel casters. The trailer hitch permits joining of several boxes to form a train.

FORK TRUCKS — *Mobilift Corp., Portland, Oregon.* Two models of fork-lift trucks, both of 2000-lb capacity, have features designed to increase the accessibility of parts requiring regular servicing and maintenance.

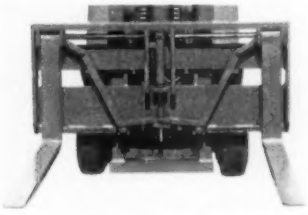
FORK TRUCK—*The Yale & Towne Mfg. Co., Roosevelt Blvd. and Haldeman Ave., Philadelphia 15, Pa.* Hydraulically operated side-shifter attachment for the Lift King and Work Saver fork trucks, shifts the forks as much as four in. to the right or left of center.



PALLET TRUCK—*The Yale & Towne Mfg. Co., Philadelphia, Pa.* A 6-in. saving on length has been effected between the battery box and front edge of the truck on the Stubby worksaver. Operated by a walking operator who adjusts controls in the handle.

TIERING TRUCK—*Mercury Mfg. Co., 511 S. Halsted St., Chicago 9, Ill.* The Model-230 Jeep fork truck features maximum elevation of 130 in. It is activated by a single-cylinder low-pressure hydraulic lift with cross suspension.

PNEUMATIC CYLINDERS—*Modernair Corp., 4222 Hollis St., Oakland 8, Calif.* Despite shorter over-all and length dimensions than conventional cylinders, the Modernair Square-Circle cylinder is claimed to provide equal power.



LIFT TRUCK—*Towmotor Corp., 1226 E. 152nd St., Cleveland, Ohio.* The operator is able to regulate the distance between the forks on this truck without leaving his seat, and while the truck is in motion. A hydraulic cylinder operating on a linkage system does the trick.

HAND TRUCKS—*Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.* Hand trucks in two power types, but of one basic design. One of the trucks, the Electro-Lift, is battery powered with motor drive; the other, the Hydro-Lift, is gasoline-engine powered with hydraulic pump and motor drive.

FACTORY TRUCK — *Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.* Has a two-speed transmission permitting 14-mph travel in high gear and 8 mph in low gear in both forward and reverse.

HANDTRUCK — *Standard Pressed Steel Co., Jenkintown, Pa.* Has a heavy pressed-steel nose that is ribbed for strength. Angle shape of the nose permits it to be triple-welded to the frame.

LIFT TRUCK—*Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.* The Utilitruc-100 is a 10,000-lb-capacity fork-lift truck, gasoline powered and equipped with Dynatork Drive.

INDUSTRIAL TRUCK—*Elwell-Parker Electric Co., Cleveland, Ohio.* Has its platform hinged at a line midway of its length. The two sections are joined by hinges. Capacity is 4000 lb.

FORK TRUCK—*The Yale & Towne Mfg. Co., Philadelphia 15, Pa.* This truck is available in 3000- and 4000-lb capacities in two models. One has an overall height of 83 in. and a total lift of 121½ in. and the other an overall height of 68 in., and a total lift of 91½ in.

HAND TRUCKS—*Donaldson Co., Inc., 666 Pelham Blvd., St. Paul, Minn.* This flexible tier truck is equipped with two wheels and one full-swiveling caster and can be moved about by one operator.

ELECTRIC TRUCKS—*Automatic Transportation Co., 149 W. 87th St., Chicago, Ill.* The Transporter 101 is available in 4000- and 6000-lb capacities in either pallet or platform models. The pallet model is a foot shorter than previous units and 5½ in. have been cut off the platform unit.

HAND TRUCK—*Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y.* The frame of the No. A-106 hand truck is 13¾-in. wide and 45-in. high and is of one-piece all-welded steel construction.

CABLE-REEL TRUCK — *Lyon-Raymond Corp., 477½ Madison St., Greene, N. Y.* Materials on spools can be transported and positioned with this hydraulic truck. Single-speed hydraulic hand pump and hydraulic cylinder actuate the lifting mechanism.

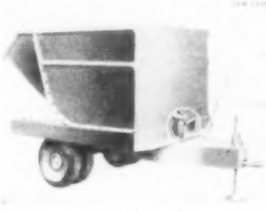
END DUMP—*Palmer-Shile Co., Detroit, Mich.* A speed-up in production is claimed for these end dumps equipped with wheels. The units may be handled by platform or fork truck.

HAND TRUCK—*The Rapids-Standard Co., Inc., Grand Rapids, Mich.* Wheel-Ezy single-handle hand truck is of "knitted frame" construction, providing extra load capacity, but retaining lightness. Frame is of 16-gage high-carbon-steel tubing.

LIFT TRUCK — *Market Forge Co., Everett, Mass.* The Load-Mobile electric lift truck has a high-low switch provided for easier maneuverability in close quarters.

TIERING TRUCK — *Lyon-Raymond Corp., 4769 Madison St., Greene, N. Y.* The Spacemaker can be furnished to handle any standard size two-face pallet. Forks elevate to 130 in.

PLATFORM-TRUCK — *The Rapids-Standard Co. Inc., Department RT-338, 342 Rapistan Bldg., Grand Rapids 2, Mich.* The entire deck of the Roustabout light-weight platform truck is die formed on a brake from one piece of steel and is then arc-welded to eliminate sharp angles and bulkiness.

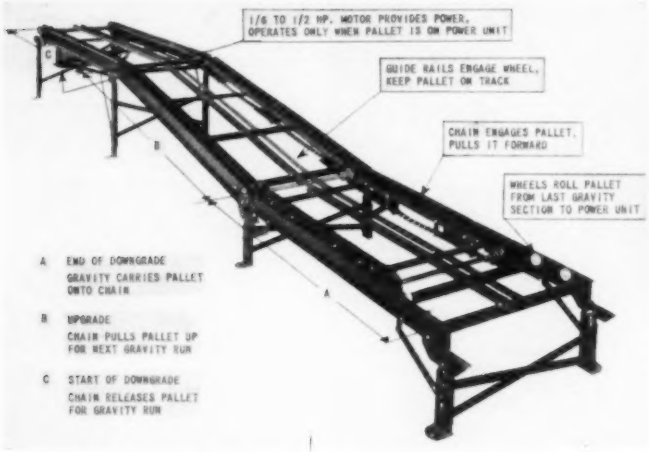


DUMP TRAILER—*Phillips Mine & Mill Supply Co., 2322 Jane St., Pittsburgh 3, Pa.* A safety lock on the Model DP-3B dump trailer provides positive locking and prevents accidental dumping of loads.

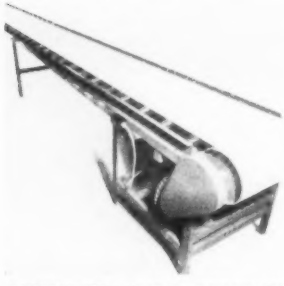
STOCK CARRIER—*Rack Engineering Co., 925 Liberty Ave., Pittsburgh 22, Pa.* Designed with removable sides and ends and of all-welded construction. Built in 20 different sizes.

PLATFORM TRUCK — *The Rapid-Standard Co., Inc., Dept. CPT, 342 Rapistan Bldg., Grand Rapids 2, Mich.* Decks in sizes from 24x48 to 36x72 in. of 13/16-in. dressed-paraffin oil-treated hardwood, are available on these trucks.

TRAILERS—*Market Forge Co., Everett, Mass.* Fifth-wheel trailers made by Market Forge have a close-coupling feature that automatically links the trailers 18-in. apart.

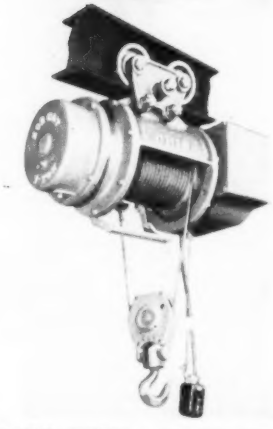

1/6 TO 1/2 HP. MOTOR PROVIDES POWER, OPERATES ONLY WHEN PALLET IS ON POWER UNIT
GUIDE RAILS ENGAGE WHEEL, KEEP PALLET ON TRACK
CHAIN ENGAGES PALLET, PULLS IT FORWARD
WHEELS ROLL PALLET FROM LAST GRAVITY SECTION TO POWER UNIT
A END OF DOWNGRADE
GRAVITY CARRIES PALLET ONTO CHAIN
B UPGRADE
CHAIN PULLS PALLET UP FOR NEXT GRAVITY RUN
C START OF DOWNGRADE
CHAIN RELEASES PALLET FOR GRAVITY RUN

CONVEYOR — *The Rapids-Standard Co., Inc., Dept. GP, 342 Rapistan Bldg., Grand Rapids 2, Mich.* Called the Guided Pallet Conveyor, this equipment is designed for handling mixed goods requiring varied processing periods, using gravity and power.

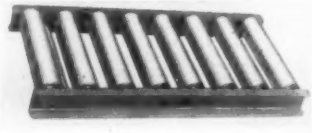


CONVEYOR—*Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y.* Drive unit with motor and control equipment, and the tail end with a 4-in. tail pulley and tracking idler may be connected by standard 10-ft sections.

CHIP CONVEYOR—*May-Fran Engineering, Inc., 1677 Clarkstone Road, Cleveland 12, Ohio.* Designated as Chip Tote, these conveyors have the speed of operation synchronized with the metal-removing capacity of the machine with which it is being used.

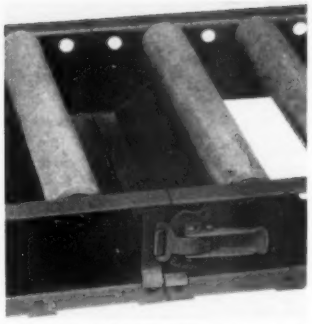


CABLE HOISTS — *The Ohio Electric Mfg. Co., 5900 Maurice Ave., Cleveland 4, Ohio.* Heavy-duty electric hoists range in lifting capacity from ½ to 5 tons. The motor of the Bob-Cat hoist is totally enclosed within the cable drum.

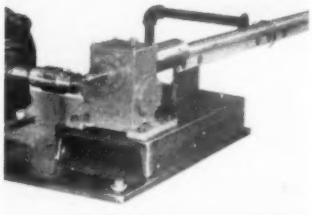


ROLLER CONVEYORS—*Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y.* Utility roller conveyors employ Sage ball-bearing wheels as end bearings for the rollers.

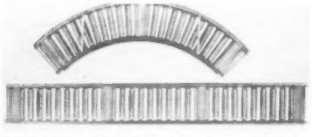
SPUR CURVE—*Rapids-Standard Co., Inc., 342 Rapistan Bldg., Grand Rapids 2, Mich.* Has been developed for use in Rapistan gravity-conveyor systems which automatically stop material cases. It regulates the flow of goods from two converging conveyor lines.



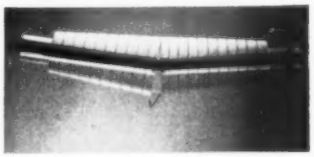
ROLLER CONVEYORS—*Steel Parts Mfg. Co., Div. Blackstone Mfg. Co., Inc., Chicago, Ill.* Roller conveyor, called Metalok, has a coupling which speeds attaching one length to another and then locking them in place with a positive grip.



BENCH CONVEYOR—*Teleflex Inc., P.O. Box 4408, Nicetown, Philadelphia 40, Pa.* Teleflex conveyor consists of two principal components: a flexible cable and a metal rail. The cable provides a spiral thread on its exterior; the results being comparable to a flexible screw of any desired length.



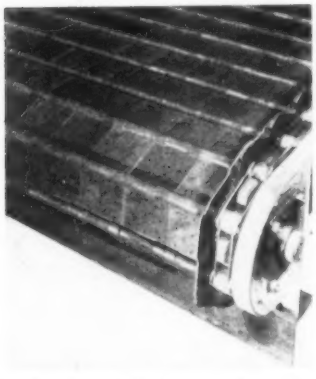
ROLLER CONVEYORS — *Rapids-Standard Co. Inc., Dept. RRC, 342 Rapistan Bldg., Grand Rapids 2, Mich.* Made in 5-, 8-, and 10-ft sections, and 12- and 18-in. widths, these aluminum conveyors are intended for operations where lines must be moved frequently, and for locations where non-sparking equipment is required.



CONVEYOR ROLL — *United States Steel Corp., New York.* The problem of centering power belts, conveyor belts, or materials conveyed on roller tables without the use of outside guides, is said to have been solved by this roll. The unit is a slightly crowned roll, cut transversely at the center.

BELT CONVEYOR — *Standard Conveyor Co., North St. Paul 9, Minn.* The Utility Belt-Veyor can be used for elevating and lowering boxes, cartons, or sacks between floors or conveying them on a horizontal plane.

POWER-BELT CONVEYOR — *The Rapids-Standard Co., Inc., Dept. No. D, 342 Rapistan Bldg., Grand Rapids 2, Mich.* Nosed-over delivery section added to the Floor-Veyor, Jr. provides easy transfer of materials from inclined to horizontal conveyor units or vice versa.



CONVEYOR BELTING — *May-Fran Engineering, Inc., 1677 Clarkstone Rd., Cleveland, Ohio.* This hinged belting is said to have been developed to facilitate mechanized handling of hot, heavy, or highly abrasive metal parts, scrap, and forgings as well as wet or dry chips.

TRAMRAIL TROLLEY—*The Forker Corp., 2024 Random Road, Cleveland 6, Ohio.* Chilled cast-iron wheels of 4½-in. thread dia, rolling on high-carbon, high-manganese steel rails, are said to reduce friction losses to a minimum on this tramrail trolley.

CONVEYOR — *The Rapid Standards Co. Inc., Grand Rapids 2, Mich.* Consists of a drive unit and a tail section, each constructed of 10-gage, 8-in.-deep steel channel frame.

CONVEYOR — *The Rapids-Standard Co., Inc., Dept. CRPD, 342 Rapistan Bldg., Grand Rapids 2, Mich.* Easily rolled from one job to the next, the cleated Rapid Power Booster moves bags, cartons, crates, and similar materials at inclines up to 45°.

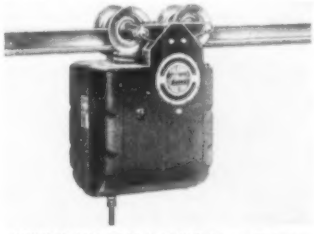
CONVEYOR — *Rapids-Standard Co. Inc., Dept. FPV, 342 Rapistan Bldg., Grand Rapids 2, Mich.* Portable power-belt conveyor handles hot or cold forgings weighing up to 25 lb. Has cleated wire-mesh belt.

CONVEYOR—*Industrial Engineering and Mfg. Co., Brimfield, Indiana.* Model 408-U conveyor is built especially for carrying parts from a punch press. It has a channel length of 8 ft and comes equipped with six-inch side panels.

WHEEL-CONVEYOR CURVES—*Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y.* Have combination stud and hook couplings on both ends. This feature makes it possible to attach the curves for either right or left turns regardless of the coupling on the end of the straight section.

MONORAIL SYSTEM—*Whiting Corp., Harvey, Ill.* The Trambeam monorail materials-handling system is for overhead handling of light loads and shorter spans.

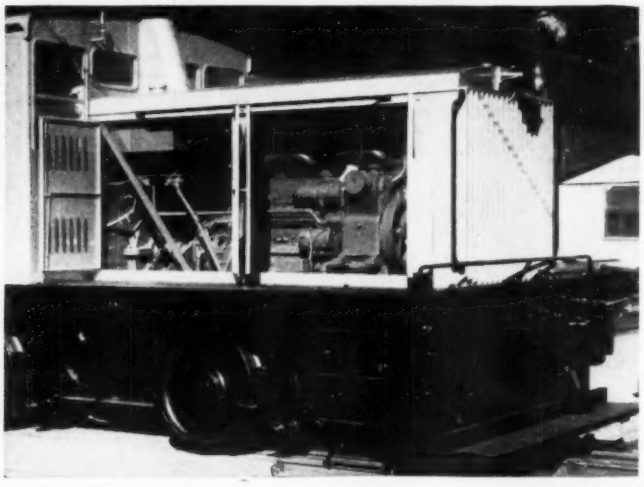
POWER-BELT CONVEYOR — *The Rapid-Standard Co. Inc., Dept. ASJ, 342 Rapistan Building, Grand Rapids 2, Mich.* Weighing less than 350 lb, the Stevedore, Jr. two-wheel power booster and stacker is said to be almost as easily rolled into position as a wheelbarrow.



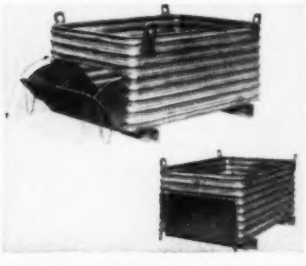
MONORAIL TRACTOR — *Calabar Corp., South Gate, Calif.* Fluid tractor for propelling electric or hand hoists on monorails and cranes is controlled by magnetic reversing contractor and pendant push-button.

PORTABLE CONVEYOR—*May-Fran Engineering, Inc., 1677 Clarkstone Road, Cleveland 12, Ohio.* Handles small stampings, chips and granular materials. Working height is regulated through a 30-in. range.

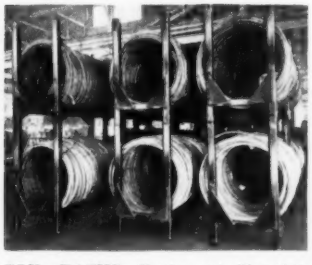
PACKAGE CONVEYOR — *George Haiss Mfg. Co., Inc., 141st St., New York 51, N. Y.* For loading trucks, it has a low-cost channel framel. Caster-wheel or pneumatic-tired mounting is available.



SHOP LOCOMOTIVES — *Plymouth Locomotive Works, Div., Fate-Root-Heath Co., Plymouth, Ohio.* Hydraulic torque-converter locomotives are being built, with the converter installed between the engine and the final drive.

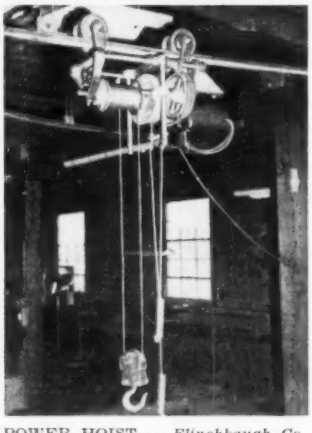


STACKING BOX—*Palmer-Shile Co., Detroit, Mich.* The chain-operated hinged door on this stacking box can be opened to any set angle, simplifying parts disposal.

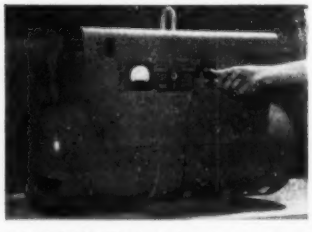


COIL RACKS—*Equipment Manufacturing, Inc., 21550 Hoover Road, Detroit 5, Mich.* Portable coil racks have nesting caps welded on the tops or bottoms of the upright members to permit safe stacking to any height. The caps are self-centering.

SKIP-TOTE BOX—*Palmer-Shile Co., 16019 Fullerton, Detroit 27, Mich.* Has trunnions for convenient handling by fork truck or crane. The box is of corrugated all-steel construction with welded joints.



POWER HOIST — *Flinchbaugh Co., York, Pa.* Electric power hoist will lift 500 lb at 25 fpm, or 250 lb at 50 fpm. Maximum lift or pull is 200 ft. Powered by a ¼-hp. motor.

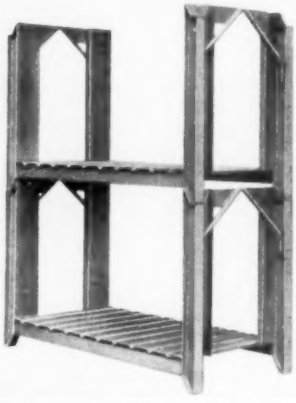


BATTERY CHARGER—*General Electric Co., 1 River Rd, Schenectady 5, N. Y.* Single-circuit battery-charging equipment, for electrical industrial trucks, is fully automatic and has more than 2000 available adjustments of charging characteristics.

MATERIALS HANDLING BOX—*Palmer-Shile Co., Detroit 27, Mich.* Made of corrugated steel, and has heavy-duty casters.

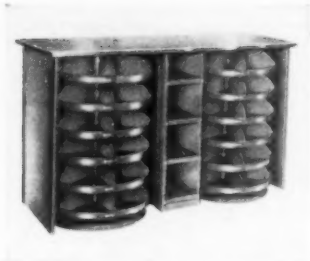
PORTABLE DRUM RACKS—*Penco Engineering Co., 725 Second St., San Francisco 7, Calif.* Feature tilting and positive locking in any position for easy accessibility and maximum drainage.

LIFTING CLAMP—*Merrill Brothers, 56-02 Arnold Ave., Maspeth P. O., New York, N. Y.* The Adjusta-Clamp has a movable gripping jaw that can be quickly set by hand to accommodate parts being lifted. Comes in 1- and 3-ton capacities weighing 30 and 60 lb respectively.



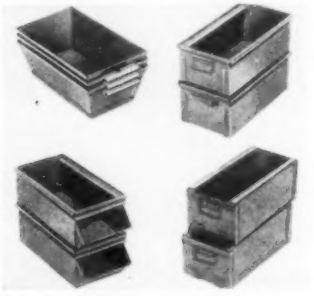
STACKING RACKS — *The Palmer-Shile Co., 16019 Fullerton, Detroit 27, Mich.* Interlocking ends on all-steel stacking racks prevent shifting. Of welded construction with corrugated bottom and I-beam ends.

CASTER WHEELS—*The Bassick Co., Bridgeport 2, Conn.* Powders composed of tiny particles of metal and graphite are used under pressure to mold caster wheels.



STORAGE COUNTER — *The Frick-Gallagher Mfg. Co., 250 S. Broad Street, Philadelphia 2, Pa.* Rotabin counter provides aisle access to 72 large compartments in twelve 28-in.-diameter independently rotating trays.

LIFTING MAGNET — *Ohio Electric Mfg. Co., 5900 Maurice Ave., Cleveland, Ohio.* Ohio "basket" lifting magnets feature on outer ring cast in one piece with four integral ears which project beyond the outer-ring circumference and protect the magnet from damage.



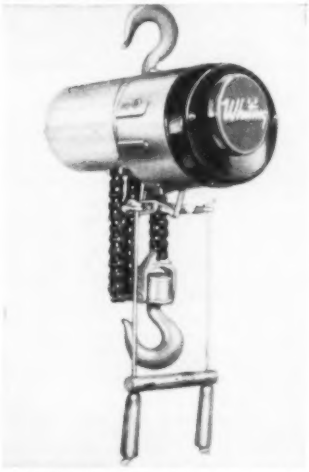
SHOP BOXES—*Union Metal Mfg. Co., Canton 5, Ohio.* Line of shop boxes incorporate innovations such as full-length bottom runners, one-piece bottom and end construction and double-reinforced corners.

HAND CHAIN HOISTS—*Philadelphia Div., The Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa.* Hoists made by Yale are said to have 95% efficiency, and weigh but 37 lb. The use of strong aluminum castings and alloy steel, plus fewer parts, reduce its weight.

SLINGS—*The Cleveland Chain & Mfg. Co., Cleveland 5, Ohio.* Line of wrought-iron sling chains consists of a wide variety of single, double, three-way and four-way slings of virtually any desired length.

SHOP HOIST—*Unit Mfg. Co., Minneapolis, Minn.* Hydraulically powered ⅜-ton shop hoist can be mounted on a three-wheel tubular-steel floor frame or on truck beds, workbenches, and loading docks. It can lift 1500-lb loads 77½ in. in 45 sec.

TOOL CABINET—*Standard Pressed Steel Co., Jenkintown, Pa.* This easy-rolling unit is made of heavy-gage steel and is provided with padlock attachments to protect contents.



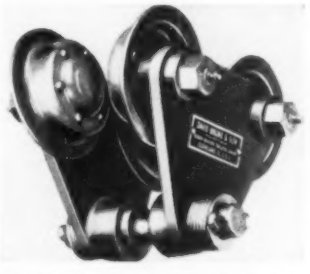
CHAIN HOISTS—*Whitney Corp., Harvey, Ill.* A spring-set shoe-type motor brake with lining bonded to the shoe, on this electric chain hoist provides improved braking power and longer brake life.

TROLLEY—*Industrial Equipment Co., 315 N. Ada St., Chicago 7, Ill.* The Moto-Trolley is designed for attachment to any standard lugmounted electric hoist.

STORAGE BIN—*Service Parts System, 4607 St. Aubin St., Detroit, Mich.* For small parts; has 100 separate compartments. All are tilted forward to meet the eye and have rounded bottoms to make parts easier to pick out.

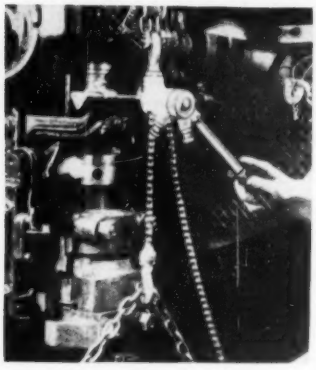
BATTERY CHARGER—*Motor Generator Corp., Hobart Square, Troy, Ohio.* Six-cell lead-acid batteries of up to 300 ampere-hour capacity can be charged by the Model 669-6-1. Built as an integral unit it is 100% automatic in operation.

TOOL CABINET — *Plomb Tool Co., Los Angeles, Calif.* A buyer may custom-build his own cabinet in these units because the runners permit any of three basic sizes of drawers to be installed in any combination.



TROLLEY—*David Round & Son, Broadway and Henry St., Cleveland 5, Ohio.* Deep flanges on the Rocket Trolley prevent climbing of the track and the unit is equipped with sealed ball-bearing wheels.

CASTERS—*Rapids-Standard Co., 342 Rapistan Bldg., Grand Rapids 2, Mich.* 500 Series flame-hardened casters are designed for heavy-duty service on racks, dollies, and portable equipment.



HAND-OPERATED HOIST—*Coffing Hoist Co., Danville, Ill.* This hand-operated puller, called The Mighty Midget, weighs 9½ lb. and takes up less than one ft of space yet handles a 1000-lb load on any lifting, stretching, or pulling job.

FORK-SHOVEL ATTACHMENT — *Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.* A heavy-duty attachment for lift trucks, with 7¾-in. long tines, is said to be saving time in the handling of loose materials such as castings.

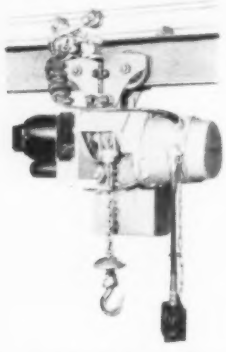
TOOL CABINET—*J. H. Williams & Co., 400 Vulcan St., Buffalo 7, N. Y.* The assortment of lathe-tool accessories contained in this cabinet includes high-speed cutters, cutoff blades, formed cutters for threading tools, sleeve and plain bars, light boring bars, and knurled and set screws for tool holders.

PEG-RACK CONVEYOR — *Rack Engineering Co., Connellsville, Pa.* Designed for the handling and protection of machined or polished parts. Brings the machine operator his work properly positioned.

SHOP LOCOMOTIVES — *The Whitcomb Locomotive Co., Rochelle, Ill.* Features a hydraulic drive designed to provide the smooth, uniform power of an electric drive, at far less cost.

DOCK BOARD—*Beacon Experimental & Engineering Co., 714 North 13 St., St. Louis 3, Miss.* For both truck and freight-car loading, has vertical, horizontal, and lateral movement.

CRANE—*Clyde Iron Works, Inc., Duluth 1, Minn.* Known as the Model UC, it is mounted on a Minneapolis Moline Model UTI tractor and has a high-lift capacity of 5 tons.



HOIST—*The Yale & Towne Mfg. Co., Philadelphia Div., Philadelphia 15, Pa.* Available in load capacities of 500, 1000, and 1500 lb, the Load King electric hoist provides lifting speeds up to 41 fpm, and lower and upper limit stops.

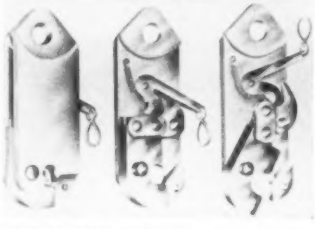
PORTABLE HOIST — *Lift-All Equipment Co., 500 N. E. 97th Ave., Portland, Ore.* The Lift-All, designed for one-man operation, will hoist, lower, stop, and hold weights up to 2000 lb.

PACKING CONTAINER—*Steel Drum Packaging and Accessories Inc., 9505 Sandusky Ave., Cleveland 5, Ohio.* This airtight reusable steel container has an inner pack holding the contents firmly in place, allowing an inch clearance on all sides.

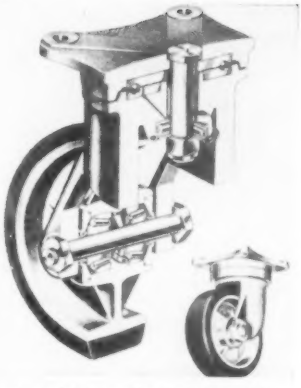
WIRE-ROPE SLING—*John A. Roebling's Sons Co., Trenton, N. J.* Employs a Walles splice that is said to add longer life and speed up production. Made without bulky servings, it prevents snagging.

DOLLY RACKS—*Equipment Mfg. Co., Inc., 21550 Hoover Road, Detroit 5, Mich.* Can be conveniently pushed by hand in assembling individual orders and then towed in trains to the loading area.

PORTABLE BAR RACKS — *Palmer-Shile Co., 16019 Fullerton St., Detroit 27, Mich.* Enable the operator to place bundles in racks for storage in tiers, any rack being easily accessible for selection of material desired.



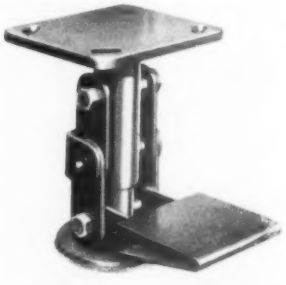
DROP HOOK—*Coffing Hoist Co., Danville, Ill.* The Coffing drop hook, a mechanical unit using toggle action, is capable of lifting, hauling, and releasing any weight up to 6000 lb.



INDUSTRIAL-TRAILER WHEELS—*Aerol Co., Inc., 2820 Ontario St., Burbank, Calif.* Heavy-duty industrial trailer wheels and casters are cast of prime aluminum alloy and are said to reduce clutch wear, battery strain, and mechanical fatigue on power towing equipment.

BALANCING HOIST—*The Platz Co., Inc., 20433 Sherwood Ave., Detroit 34, Mich.* Hoist is constructed to operate on a 4- or 6-in. standard I-beam and neutralize weight in any position within the balancing range. It swivels vertically from 0 to 17° and rotates 360°.

ELECTRIC HOISTS — *The Horton Bristol Mfg. Co., Bristol, Conn.* Lever for small hoists is said to assure positive, one-hand control.



FLOOR LOCK—*The Rapids-Standard Co., Inc., Grand Rapids 2, Mich.* A leaf treadle on this floor lock for portable elevators, conveyors, and floor trucks provides instant positive locking and release action.

SLEWING CRANE ARM—*Towmotor Corp., Cleveland, Ohio.* Attaches to fork trucks. Permits rapid, easy positioning in freight cars of loads up to 800 lb at an 80-in. load center.

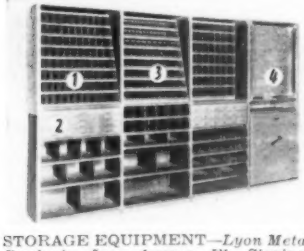
SCOOP ACCESSORY — *Towmotor Corp., Cleveland, Ohio.* For lift trucks, it picks up and transports bulk materials and is actuated by a two-way hydraulic cylinder.

CABINET BENCH—*Standard Pressed Steel Co., Jenkintown, Pa.* Has steel construction, ample storage space, standardized units, and interchangeable accessories.

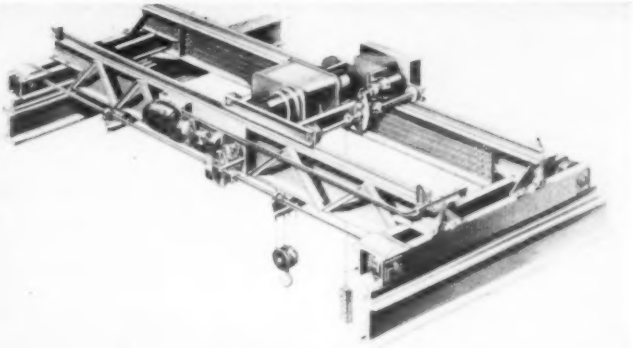
TREAD MATERIAL—*Aerol Co., Inc., 2820 Ontario St., Burbank, Calif.* For industrial wheels, it is composed of macerated canvas-duck, impregnated with phenolic resin.

CASTERS—*The Rapids-Standard Co., Inc., Dept. CF, 342 Rapistan Bldg., Grand Rapids 2, Mich.* Industrial casters with forged-steel strength but manufactured at stamped-steel production costs are manufactured in five wheel types: nickel-steel, Durastan plastic, molded-on rubber, cushion, or hard rubber.

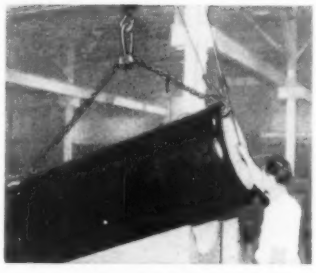
STOCK RACKS — *Palmer-Shile Co., 16019 Fullerton, Detroit 27, Mich.* Concave-shaped guards on these all-steel stock racks insure snugly resting loads and eliminate contact with dust and dirt and danger of the load falling when rack is lifted.



STORAGE EQUIPMENT—*Lyon Metal Products, Inc., Aurora, Ill.* Sloping-front unit (1) provides 88 openings in 8 depths with shelf dividers adjustable every inch. Each drawer of drawer-case unit (2) has five dividers. Sloping-shelf unit (3) has 108 compartments on 8 shelves for storing drills, reamers, and taps. Swinging panel unit (4) allows 27 sq ft of storage area.



TRAVELING CRANE—*Whiting Corporation, Harvey, Ill.* The use of stock parts and quantity-built components allows a lower initial cost on E-type cranes, designed for overhead-traveling work. A pendant push-button control station may be operated from the floor if desired.



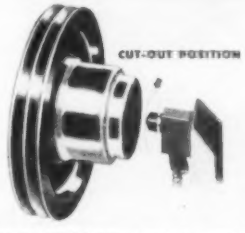
SLING-CHAIN ADJUSTER — *American Chain Div., American Chain & Cable Co., Inc., York, Pa.* Sling-chain adjuster permits the lifting of an object at any angle desired. By shifting the chain in the pocket wheel, one leg is made longer and the other leg shorter.

FEEDER — *Free-Flow Co., 1530 N. Gordon St., Hollywood 28, Calif.* Free-flow feeders and conveyors are mechanical-vibration units with positive action said to insure uniform conveying speed regardless of load.

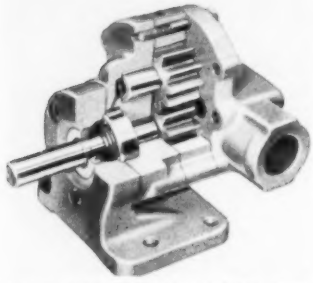
LIFTING MAGNET—*Dings Magnetic Separator Co., 4740 W. Electric Ave., Milwaukee 46, Wis.* Some improvements over earlier models: lighter weight and an insulating compound that dissipates heat more rapidly and provides more protection against short circuits.

MATERIALS HANDLING BOX—*Phillips Mine and Mill Supply Co., 2322 Jane St., Pittsburgh 3, Pa.* A collapsible, 2000-lb-capacity box, which may be erected in less than 20 sec, folds down to a height of 9 in. with a level top surface.

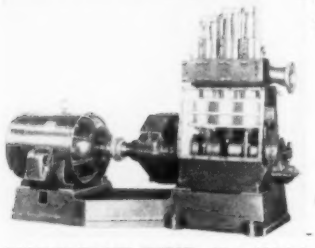
PORTABLE ELEVATORS — *Barrett-Cravens Co., 4609 S. Western Blvd., Chicago 9, Ill.* The portable elevator shown is equipped with a safety device which prevents the platform and its load from dropping if the cable breaks. A vertical saw-tooth member engages a safety pawl.



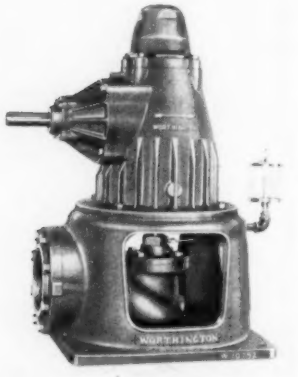
SAFETY CUTOUT—*Anchor Steel and Conveyor Co., 696 Kingsley Ave., Dearborn, Mich.* Cutouts shut off electric motors instantly when conveyors or machines they are driving are overloaded, and reset them automatically.



HYDRAULIC PUMP—*Adel Precision Products Corp., 10855 Van Owen St., Burbank, Calif.* Impellers of the Adel hydraulic pump are keyed to driveshaft to prevent thrust loads from being transferred from shaft to impeller or end plates.



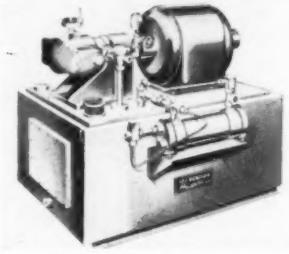
DIRECT-FLOW PUMP—*The Aldrich Pump Co., Allentown, Pa.* Direct-flow principle is employed in this pump, which features lower operating and maintenance cost.



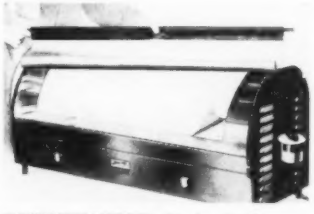
TURBINE PUMPS—*Vertical Turbine Pump Div., Worthington Pump and Machinery Corp., Harrison, N. J.* Vertical turbine pumps developed by Worthington have these features: Extra-size bearings of special material for long life, shaft seals where required, and enclosed impellers.

DUST COLLECTORS—*Hammond Machinery Builders, Inc., Kalamazoo, Mich.* Intended for grinding, polishing operations. Dust-laden air is drawn from the grinding-wheel head down through an air-expansion chamber to the bottom of the cabinet.

WHITEPRINTER—*The C. F. Pease Co., 2601 W. Irving Park Rd., Chicago 18, Ill.* The operator of this whiteprinter is able to select at his discretion either sliding revolving contact or straight revolving contact.

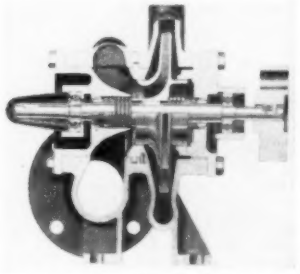


OIL HYDRAULIC PUMPS—*The Denison Engineering Co., Columbus, Ohio.* Designed to meet a wide range of fluid-power requirements for machine tools and other industrial equipment. High-pressure units are available in 22 models, to specifications recommended by the JIC.



WHITEPRINTER—*Peck & Harvey, 5736 Northwestern Ave., Chicago 45, Ill.* The Spee-Dee whiteprinter uses the Diazo (moist or ammonia dry) process to produce positive-reading whiteprints at less than 2 cents per sq ft.

PRINT DRYER—*Lott Mfg. Co., 45 Parker Ave., Jamestown, N. Y.* Portable dryer has a 23x28-in. mirror-finish stainless-steel drum which, the manufacturer claims, far outwears plated surfaces.

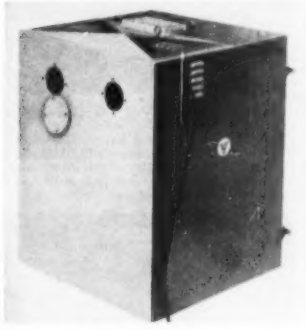


PUMP—*DeLaval Steam Turbine Co., Trenton 2, N. J.* The GS pump is designed from the ground up to fit the idea of a service and exchange plan. All parts except the bare pump casing are contained in the rotor assembly.

WHITEPRINTER — *Peck & Harvey, Dept. AM, 5736 North Western Ave., Chicago 45, Ill.* Using the dry-ammonia-fume method of diazo reproduction, this whiteprinter prints and develops blue line, black line, sepia intermediates and other whiteprints.

COPYING MACHINE — *Ozalid, Div. General Analine & Film Corp., Johnson City, N. Y.* The Streamliner is a positive-printing, dry-processing copying machine which provides constant printing speeds despite varying power-line conditions.

VAPOR COLLECTOR—*The Aget-Detroit Co., Ann Arbor, Mich.* High-volume self-contained collector for vapor and mist, the model VC-5, is equipped with a motor-mounted starting switch and drain spout for returning collected condensate to the reservoir.

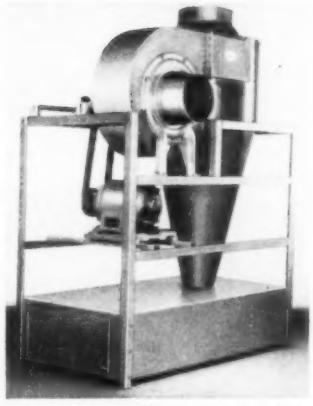


METAL-DUST COLLECTOR — *Delta Power Tool Division, Rockwell Mfg. Co., Milwaukee 1, Wis.* A squirrel-cage fan sucks both fine and coarse dust and small particles through an air filter. The filter is fireproof, has high filtering qualities, and is easily removed for cleaning.

DUST-CONTROL LIQUID—*The West Disinfecting Co., 42-16 West St., Long Island City 1, N. Y.* Known as Antiseptic Westone, it is claimed to not only remove dust from floors, but also leave an antiseptic film which inhibits bacteria.

DUST COLLECTORS—*The Kirk & Blum Mfg. Co., 2838 Spring Grove, Cincinnati 25, Ohio.* Heavy-duty portable type-M units handle dust from grinding, buffing, and polishing machines and are available in 450-, 900-, and 1800-cfm models.

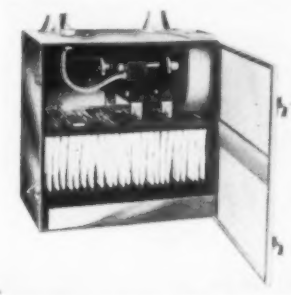
DUST COLLECTOR — *Aget-Detroit Co., Ann Arbor, Mich.* Model 30N50 Dustkop develops 3630 cfm (velocity 10,400 fpm). A self-clearing, paddle-wheel fan direct-driven by a 5-hp continuous-duty motor clears lint and strings from buffing, chips, shavings.



DUST COLLECTOR — *Aget-Detroit Co., Ann Arbor, Mich.* The Model 90N50 Dustkop dust collector is available as a standard, pretested unit, ready for shipment from stock.

VAPOR COLLECTOR — *Brown & Sharpe Mfg. Co., Providence 1, R. I.* This motor-driven attachment removes particles of oil from mist around machines. The attachment consists of a motor-driven fan mounted on a dispersing tank.

DUST COLLECTOR—*Hammond Machinery Builders, 1600 Douglas Avenue, Kalamazoo, Michigan.* Cyclone dust collectors are said to provide up to 95% dust precipitation. It can be adapted for either outside exhausts or equipped with a filter bag.



DUST COLLECTOR—*The Hisey Wolf Machine Co., Cincinnati 8, Ohio.* Dust- and grit-laden air from this dust collector is filtered through closely woven fabric and steel-wool filter bags, after which it is exhausted inside the building.

DUST COLLECTORS—*Hammond Machinery Builders, Inc., 1618 Douglas Ave., Kalamazoo, Mich.* Two models, added to the line of Cyclone units. Model CYO-6 is for exhausting air to the outside. Model CYB-6, fitted with a dustproof bag, permits recirculating the air.

MAGNETIC CLEANER — *F. W. Shrader Co., 5788 Washington Blvd., Culver City, Calif.* Permanent-magnet clean-up unit, designed for use on any hard surface area where scattered ferrous materials must be removed.

EYE SHIELD—*Stanley Electric Tools, New Britain, Conn.* The 6x10-in. window protects the operator from dust, or chips. It can be mounted on any machine on a horizontal or vertical surface.

SAFETY SHOES—*Safety First Shoe Co., Holliston, Mass.* Available in an 8-in. model which affords protection above the ankle and also an ankle-high shoe which has been designed with heavy oak-leather single soles.

RESPIRATOR—*American Optical Co., Southbridge, Mass.* Goggle combination recommended for protection against chemical splashes, spray, and light impact of foreign particles and exposures to fine dust.

FUSED LENS—*American Optical Co., Southbridge, Mass.* Bi-colored lens is designed to protect the eyes of workers engaged in heat-treating and furnace operations.

RESPIRATOR HOOD — *American Optical Co., Southbridge, Mass.* Said to be light and comfortable, this respirator hood protects against a variety of dusts or gases by means of seven cartridges.

DUST RESPIRATOR — *Pulmosan Safety Equipment Corp., 644 Pacific St., Brooklyn 17, N. Y.* Can be used for all known toxic dusts which are not significantly more toxic than lead. Carries approval of the U. S. Bureau for Lead Dusts.

VACUUM CLEANER—*Applance Div., U. S. Hoffman Machinery Corp., 105 Fourth Ave., New York 3, N. Y.* Identified as the No. 15, this portable cleaner is a 1½-hp machine which will operate one 35-ft length of hose.

VACUUM CLEANER—*U. S. Hoffman Machinery Corp., 105 Fourth Ave., New York 3, N. Y.* Portable cleaner has two-sweeper cleaning provided with 7½-cu. ft. dust-container capacity and simultaneous operation of two, 50-ft lines of 1½-in. hose.

FLOOR RESURFACER—*The Monroe Co., Inc., Dept. R.S., 10703 Quebec Ave., Cleveland 6, Ohio.* Can be applied over wood or concrete floors without using metal lath or roughening concrete.

SAFETY GOGGLE—*American Optical Co., Southbridge, Mass.* Made of acetate designed expressly to fit women or men with small features.

FACE SHIELDS—*Fendall Co., 4631 N. Western Ave., Chicago 25, Ill.* Available with two different types of headgear. One is equipped with overhead brow guard or spark-deflector. The other has an open top for ventilation.

RESPIRATORS — *American Optical Co., Southbridge, Mass.* Through a system of interchangeable filters, these twin-cartridge respirators provide protection against seven respiratory hazards.

RESPIRATOR—*American Optical Co., Southbridge, Mass.* No. 2099 protects against dust, fumes, vapors, mists, smokes, and gases. No filters or cartridges are needed because fresh air comes in through a hose.

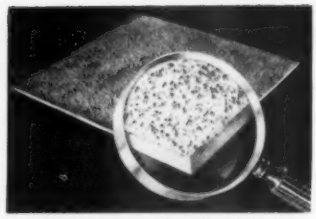
WORK GLOVE — *Richmond Glove Corp., Richmond, Ind.* Features a continuous seam on the back of the thumb. The elimination of seams on the front is said to assure longer life for the glove.

PROTECTIVE MASKS—*General Scientific Co., 2700 W. Huntington St., Philadelphia 32, Pa.* G-S masks consist of an aluminum shield, which is held in position by an adjustable elastic head band, and replaceable laminated filters of extra thickness.

FILTER RESPIRATOR — *American Optical Co., Southbridge, Mass.* Effectiveness is said to stem from treatments which apparently induce electrostatic charges in the wool fibers and their attached resin fragments. These charges attract charged dust particles.

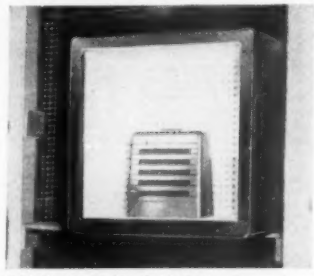
SAFETY GOGGLES — *United States Safety Service Co., Kansas City 6, Mo.* With the name "Saf-I-Duo," has a one-piece plastic lens which is removable and interchangeable.

FLOOR MAT—*Thermo-Mat Co., Los Angeles, Calif.* Measuring 14x22x5/32 in. and consisting of thermostat and micro-element cast in rubber, these heated floor mats are to protect workers from cold, drafty floors.

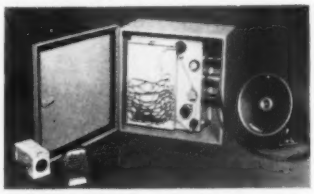


FLOOR PLATE—*Alan Wood Steel Co., Conshohocken, Pa.* Abrasive grain is being rolled as an integral part of the upper section of steel floor plate. The result is a non-skid plate that never loses its grip.

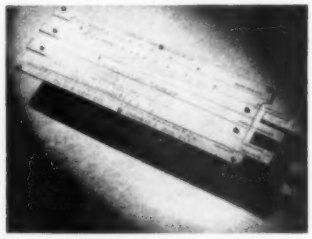
FLOOR-SURFACING MATERIAL — *United Laboratories, Inc., 16801 Euclid Ave., Cleveland 12, Ohio.* Known as Superset Plastic Rock, it is claimed to provide a tougher, more durable floor for surfaces of all kinds.



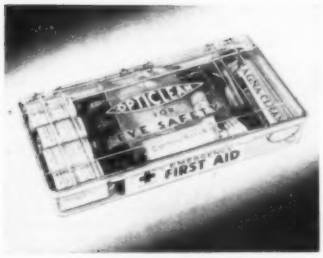
SOUNDPROOF BOOTH — *Executone Inc., 415 Lexington Ave., New York 17, N. Y.* By placing intercom stations in the Model M-15 sound booth, a high percentage of background shop noises are absorbed and not transmitted to stations in quiet areas.



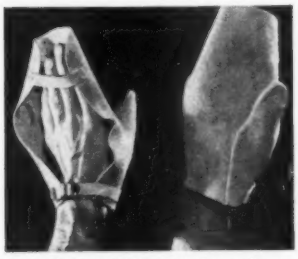
SPEAKER SYSTEM—*American Allsafe Co., Inc., 1245 Niagara St., Buffalo 13, N. Y.* The Saf-T-Vox is a compact unit for recording and automatically reproducing safety messages.



SLIDE RULE—*The G. A. Gray Co., 3611 Woodburn Ave., Cincinnati 7, Ohio.* For given return and cut speeds, length of stroke, width, and feed, the Gray planer-time calculator determines planing time.



FIRST-AID EYE KIT—*Ohio First Aid & Pharmacal Co., Cleveland 13, Ohio.* Opti-Clean kits contain a smoothed, highly magnetized wire loop which is claimed to make the removal of loose metallic bodies safe.



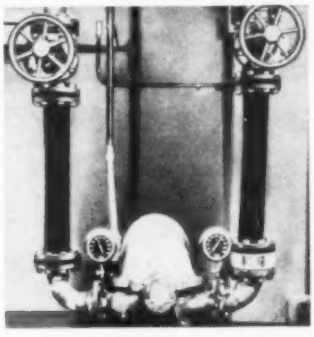
LEATHER HAND PADS — *General Scientific Equipment Co., 27th and Huntingdon Sts., Philadelphia 32, Pa.* The GS Safti-Mitt hand pads have a snap-fastened strap which keep them on any size hand and make removal easy.

MEDICAL DETERGENT — *The Gebauer Chemical Co., 9410 St. Catherine Ave., Cleveland, Ohio.* Removes oil and grease from industrial injuries. Called S. S. Spray, it is automatically dispensed from a hermetically sealed bottle.

VIBRATION ISOLATOR—*The Korfund Co., 48-39-B, 32nd Place, Long Island City 1, N. Y.* Low-cost vibration isolator has steel springs guaranteed for the life of the equipment. Housings are malleable castings sealed by a cylindrical cork ring.

ANTI-VIBRATION KIT—*The B. F. Goodrich Co., 10 E. 40th St., New York 16, N. Y.* Said to eliminate up to 75% of the vibration and shock caused by machinery. Consists of a 12-in.-square rubber pad, rubber tubes, thick washers, and an instruction booklet.

VIBRATION ISOLATOR—*Finn & Co., 2830 Eighth Ave., New York 30, N. Y.* The Finnflex SP-9 vibration isolator comes drilled, tapped, and ready for use. It consists of a steel channel floating in rubber between two steel angles, welded to a steel faceplate.

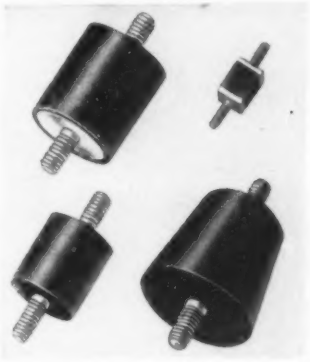


VIBRATION ABSORBER — *Finn & Co., 2850 Eighth Ave., New York 30, N. Y.* A rubber pipe, called the Soundzorber, is used as a flexible connection between the pump and the pipe line, eliminating vibrations.

EXTINGUISHER—*Randolph Laboratories, 8 E. Kinzie St., Chicago 11, Ill.* 6-lb carbon-dioxide fire extinguisher, equipped with a thumb trigger release and self-aimed nozzle, can be operated with one hand.

FIRE EXTINGUISHER — *American-La France Foamite Corp., Elmira, N.Y.* Portable dry-chemical engine, using dry nitrogen, extinguishes flammable liquid and chemical fires.

VIBRATION ISOLATOR—*Finn & Co., 2850 Eighth Ave., New York 30, N. Y.* Consists of a steel channel floated in rubber between two steel angles. The isolator approximates the flat spot on a stress-strain curve of relative slope.



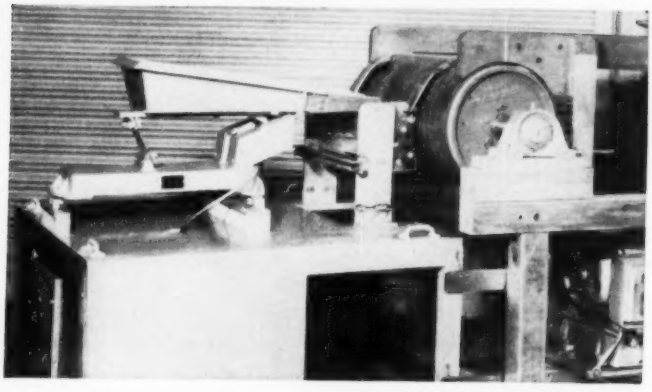
VIBRATION ISOLATORS — *Finn & Co., 2850 Eighth Ave., New York 30, N. Y.* Finneflex stud-type isolators are said to effectively control transmitted vibrations when installed either in compression or shear.

FIRE DETECTOR—*Fireye Corp., 77 Broadway, Cambridge 42, Mass.* This fire-protection system makes use of a photoelectric principle to detect fires. It is designed to ignore sunlight, artificial illumination, or other extraneous light of any intensity.

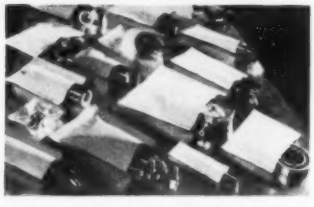
FIRE EXTINGUISHERS—*American-LaFrance-Foamite Corp., Elmira, N. Y. Walter Kidde & Co., Inc., Belleville 9, N. J.* American-LaFrance-Foamite and Walter Kidde have developed 2½-gal. portable fire extinguishers for water, soda and acid, and foam, made of stainless steel. Increased strength and pressure resistance, and decreased over-all weight are claimed for the extinguishers.

SPOTLIGHT—*Sciaky Bros. Inc., 4915 West 67th St., Chicago, Ill.* Blind spots in machining operations can be brought to light with the Sciaky locating spotlight. It is positioned on a ball-and-socket joint and provides a lens for focusing the light beam.

FIRE NOZZLE — *Bete Fog Nozzle, Inc., Greenfield, Mass.* Known as the G-5 fire nozzle, this unit can be changed from full fog to straight stream to complete shut-off by a turn of the handle.



AGITATOR—*Eriez Mfg. Co., State St., Erie, Pa.* Non-electric separator is designed to separate small amounts of non-magnetic material from large amounts of magnetic material. The unit has a permanent magnetic pulley.



NAILER—*The Heller Co., 2153 Superior Ave., Cleveland 14, Ohio.* Automatically fed nailer is said to be five times faster than ordinary nailing.

RAW-MATERIAL CALCULATOR—*H. R. Potter Co., P. O. Box 318, Montague Place, Montclair, N. J.* This raw-material calculator is used to determine raw-material requirements directly from blueprints or a sample piece. Material required is read directly in pounds per 1000 pieces.

STEEL TAPE—*Master Rule Mfg. Co., Inc., Middletown, N. Y.* Rewinds itself automatically, taking but 10 sec for the full 50 ft.

MOISTUREPROOF BAGS—*The Munson Bag Co., 1343 W. 117th St., Cleveland 7, Ohio.* Protect machine surfaces, tools, and instruments in storage or transit. They can be fabricated from polyethylene only, or polyethylene laminated to foil, kraft, or cloth-backed foil.

HAND CLEANER — *Amaza Laboratories, Box 4114, Cleveland 23, Ohio.* Reported to thoroughly remove industrial hand soil, with or without water. Contains special antiseptics and lanolin.

HAND CLEANER — *Kalene Corp., Dept. AM, Minneapolis, Minn.* Removes grease, tar, paint, printers' ink; without harsh solvents or grits that irritate the skin.

SOAP DISPENSER—*Turko Products Inc., 6135 South Central Ave., Los Angeles 1, Calif.* Has a baffle plate at the top making it impossible for workers to force open the lid in order to scoop out handfuls of compound.

ZEOLITE WATER SOFTENER — *Cochrane Corporation, Philadelphia 32, Pa.* For industrial plants where the requirements are under 100 gal. per min. High- and low-exchange green sand, synthetic gel, and resinous zeolite are offered.

FOG PREVENTER — *Master, 4444 Brooklyn Ave., Los Angeles 22, Calif.* Safety goggles and welder's hoods can be prevented from fogging by a chemical with a petroleum-derivative base and containing silicones among other ingredients.

FOG-FREER—*The Wilkins Co., Inc., Cortland, N. Y.* A surfactant-silicon composition stops fogging and steaming of glasses.

CAR-DOOR OPENER — *The Nolan Co., 29 Pennsylvania St., Bowerton, Ohio.* Has a large, positive-locking safety hook, which cannot become detached in operation. It can be swung 180°, but locks itself in place when assuming the pulling position.

PRODUCTIVITY-SCOPE—*R. G. Bock Engineers, Lincoln National Bank Bldg., 1951 Irving Park Rd., Chicago 13, Ill.* The Productivity-Scope is designed to measure and signal performance while a job is running. A plastic unit, it has scales calibrated in terms of hours worked and hours earned.

SHIPPING COATING—*Fidelity Chemical Products Corp., 470 Frelinghuysen Ave., Newark 5, N. J.* Temporary protection of metal objects during both storage and shipping is provided by hot metal coating called Dip-Pak No. 532.

SHOP LAMP—*Stocker & Yale, Marblehead, Mass.* Hot incandescent work lights may now be converted to cool fluorescent simply by screwing this unit into an ordinary socket.

FLUORESCENT LIGHTING—*Benjamin Electric Mfg. Co., Des Plaines, Ill.* System for slimline and 40-watt bipin lamps, called Strip-Line, is available in seven different types.

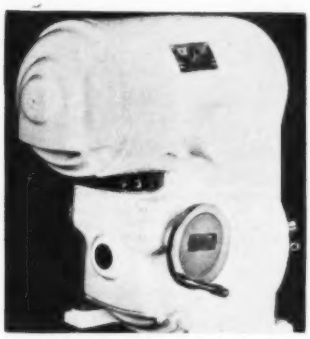
SHOP LAMP—*Enco Mfg. Co., 4522-24 W. Fullerton Ave., Chicago 39, Ill.* Utilizes an Alnico permanent-magnet base with a 50-lb pull. A universal ball and socket and a swivel arm support the lamp.

LIGHT CONCENTRATOR — *Clarkstan Corp., Los Angeles 64, Calif.* For use wherever fine work is done. It produces a spot of illumination approximately 4 in. in diameter 12 in. from the bulb.

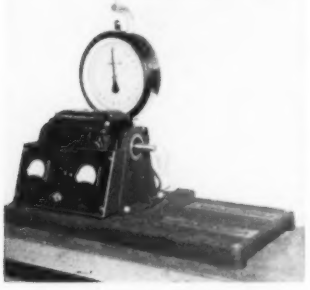
MARKING TAGS—*The Metal Marker Mfg. Co., 1364 E. 40th St., Cleveland 3, Ohio.* Mass-produced marking tags can be fabricated from aluminum, brass, steel, Monel, zinc, or tin plate and furnished in any quantity in sizes ranging from 6x6 in. to $\frac{1}{4}$x$\frac{1}{4}$ in.

MAGNETIC SEPARATOR — *Eriez Mfg. Co., Erie, Pa.* Non-electric Alnico plate magnets, used for separating tramp iron from materials in process, come in a full range of sizes.

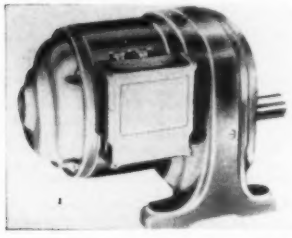
Parts and Materials



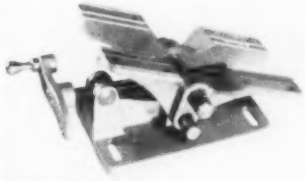
PUMP MOTOR—*Sterling Electric Motors, Inc., Los Angeles, Calif.* Speed-Trol variable-speed motor may be set for operation at a positive setting or within any pre-determined range of speed, then sealed. The sealing feature allows detection of any tampering.



DYNAMOMETER — *General Electric, Schenectady, N. Y.* Dynamometer is used in analyzing and demonstrating fractional-horsepower motors, generators, and internal-combustion engines.

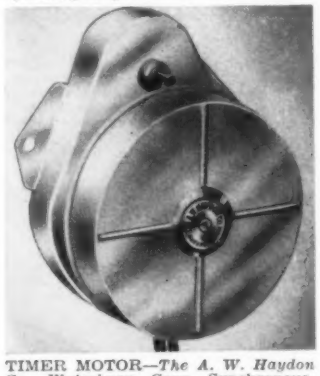


STERLING GEAR-MOTOR—*Sterling Electric Motors, Inc., Los Angeles, Calif.* Line of Slo-Speed power drives includes single-phase, capacitor designs. Built with single or double reduction gears, providing speeds from 780 down to 30 rpm, in ratings of ½ to 3 hp inclusive.

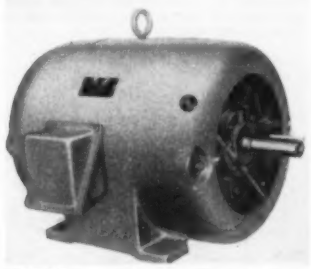


FRACTIONAL-HP MOTORS — *Terbing Mfg. Corp., 650 W. Washington Blvd., Chicago 6, Ill.* Tilting motor base weighs 10 lb and has reversible mounting brackets for versatility of installation. The handle provides easy adjustment of motor to desired position.

MOTOR DRIVE — *Reliance Electric and Engineering Co., 1111 Ivanhoe Road, Cleveland 10, Ohio.* Available in ¾- to 2-hp sizes the Reliance V S drive is being built to meet specialized requirements. Provides stepless speed selection and adjustment through the operating range.



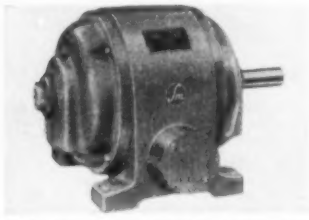
TIMER MOTOR—*The A. W. Haydon Co., Waterbury, Conn.* Synchronous-hysteresis ac timing motors provide high starting and running torque and quiet operation.



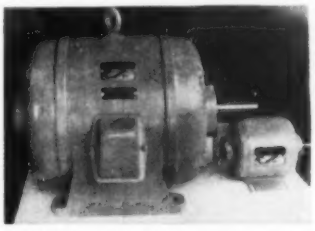
MOTORS — *Wagner Electric Corp., 6400 Plymouth Ave., St. Louis 14, Mo.* Totally enclosed cast-iron frame motors especially suitable for applications in plants where corrosion is a problem.

MOTOR—*General Electric, Schenectady 5, N. Y.* ACA motor is available with a mechanical follow-up control for achieving a fixed preset speed without the use of expensive control equipment.

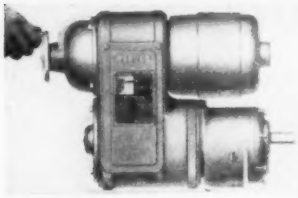
MOTOR — *Sterling Electric Motors, Inc., Los Angeles, Calif.* The Speed-Trol motor, available in the enclosed, fan-cooled design, embodies forced-draft ventilation by means of an external fan. Infinite speed adjustment is provided through a large speed indicator.



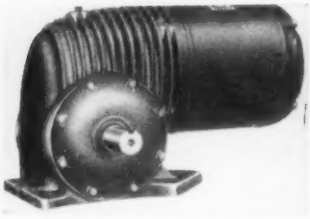
MOTOR—*Sterling Electric Motor Inc., Los Angeles, Calif.* This closed splash-proof motor may be mounted in any position and is designed for locations which are subject to direct streams of water or other liquids.



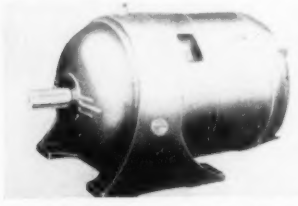
MOTOR — *Standard Dayton Corp., P. O. Box 1001, Dayton 1, Ohio.* Induction motor employs in addition to the running winding on the stator a single-phase ac winding for electro-dynamic braking.



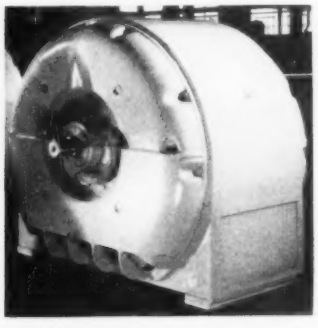
MOTODRIVE—*Reeves Pulley Co., Columbus, Ind.* These units combine motor, speed-varying mechanism, and reduction gears in one package. Hp sizes are 1/4, 1/3, 1/2, and 3/4.



GEAR MOTOR—*Century Electric Co. (Gear Motor Div.) 1806 Pine St., St. Louis 3, Mo.* Range of speeds that may be obtained in these 1½-hp motors is from 25 to 280 rpm. The armature shaft and output shaft are the only two moving parts.

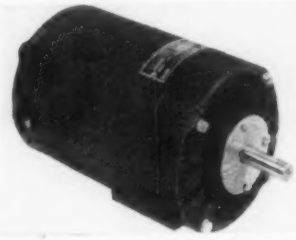


GEARMOTOR—*Foote Bros. Gear and Machine Corp., Chicago, Ill.* Manufactured in 17 sizes, provides single-, double-, and triple-reduction units with output speeds from 780 down to 7.5 rpm. Equipped with hard helical gears and can be obtained for either ac or dc operation.

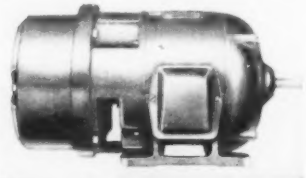


INDUCTION MOTOR — *Allis-Chalmers, Milwaukee, Wis.* Redesigned line of large, bracket-bearing, squirrel-cage induction motors of four and more poles makes the standard design dripproof.

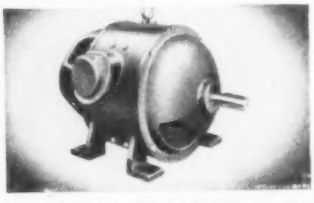
ELECTRIC PANEL METERS — *Marion Electrical Instrument Co., Manchester, N. H.* Hermetically sealed, they are available in the 4½-in. size. A solder-type zero adjuster provides adjustment without breaking the seal.



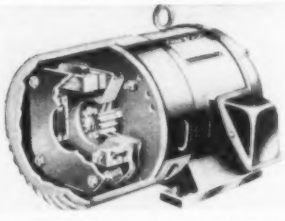
FRACTIONAL-HP MOTOR—*Howard Industries Inc., Racine, Wis.* This brush-type universal motor of ⅛ to ¾ hp was designed for use where high-starting torque and large output power at high speed is required.



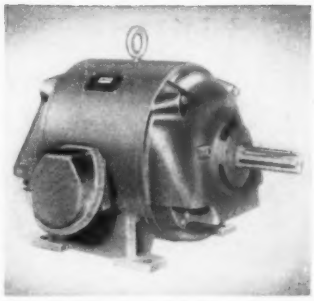
BRAKEMOTOR — *Crocker-Wheeler, Ampere, N. J.* For applications requiring frequent, instantaneous stopping and starting, the Crocker-Wheeler brakemotor employs prelubricated-for-life cartridge bearings and a brake lining said to eliminate the need for adjustment.



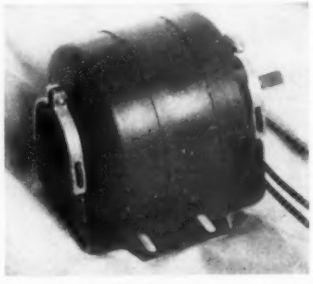
DC MOTORS—*Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.* SK direct-current life-long motors in one- to 30-hp ratings are available for constant, adjustable, or varying speed applications for either continuous or intermittent service.



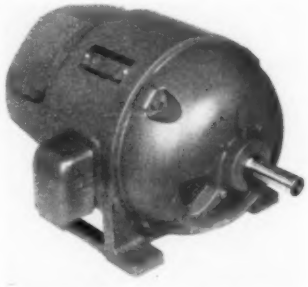
BRAKEMOTOR—*Star Electric Motor Co., Bloomfield, New Jersey.* Braking disks of the Star Brakemotors are mounted close to the motor with a shorter shaft to minimize strain and wear on shaft and bearings.



INDUCTION MOTORS—*Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.* CSP Life-Line motors are available from 7½ to 100 hp. Protected from dripping by solid rolled-steel frames and baffles in the end brackets.



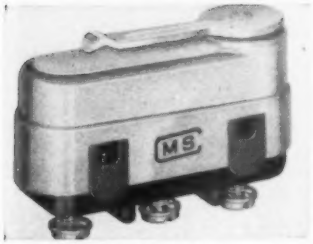
SHADED-POLE MOTORS — *General Electric Co., Schenectady 5, N. Y.* Designed for operation with the shaft in any position. Oil-saturated packing continuously feeds the bearing with filtered oil; no additional lubricant is required.



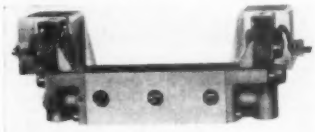
MOTOR—*General Electric, Schenectady 5, N. Y.* A motor combining the high starting torque of the repulsion motor with the constant-speed characteristics of the induction motor has been added to the Tri-Clad line.

FRACTIONAL MOTOR—*Electric Motor Corp., Div. Howard Industries, Inc., Racine, Wis.* Model 1100 is a dynamically balanced single-shaft brush-type universal motor, 1/20-hp intermittent duty and 1/25-hp continuous duty.

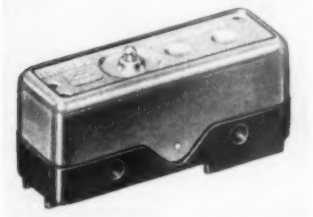
CAPACITOR MOTORS — *Sterling Electric Motors, Inc., Los Angeles, Calif.* Single-phase capacitor motors have been added to a line of drip-proof motors.



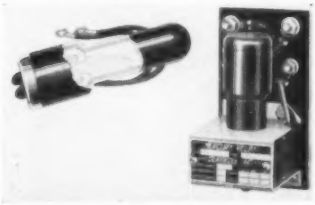
SNAP-ACTION SWITCH — *Microswitch, Freeport, Ill.* Electrical or mechanical operations of the hermetically sealed 1HS1 switch are said to be unaffected by corrosive atmospheres, change in atmospheric pressure, or change in temperature.



SOLENOID VALVE—*C. B. Hunt & Son, Inc., Salem, Ohio.* Quick-as-Wink pilot-operated single-plunger control valves employ small solenoids, traveling through a ⅛-in. stroke, to move a pilot plunger. This plunger applies air to the operating piston to move the main valve plunger back and forth.

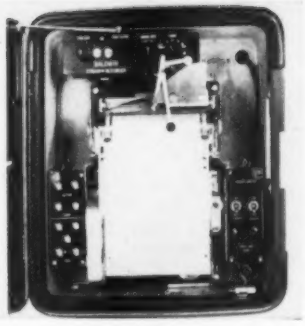


SWITCH—*Unimax Switch Div., The W. L. Maxson Corp., 460 W. 34th St., New York 1, N. Y.* A low-operating force with a large movement differential is provided by this snap-action precision switch.



SWITCHES—*Durakool Inc., Elkhart, Ind.*—Mercury switches and timer-relays have triple-distilled mercury which is cleaner than that previously used. A higher-arc ceramic, and a metal-conditioning process said to reduce resistance are other improvements.

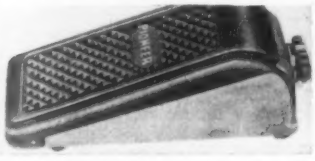
SOLENOID VALVE — *Skinner Electric Valve Div., The Skinner Chuck Co., Norwalk, Conn.* For oil burners, it features a soft synthetic seat and seals, to prevent leakage.



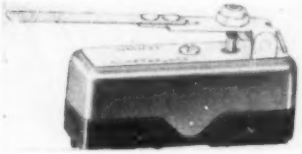
STRAIN RECORDER—*The Baldwin Locomotive Works, Philadelphia 42, Pa.* A strip-chart recorder for surface strain measured by SR-4 resistance-wire gages. An electronic instrument, designed and calibrated for use with two SR-4 gages.

SWITCH — *Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.* Automatically connects or disconnects an electric circuit after a predetermined time interval.

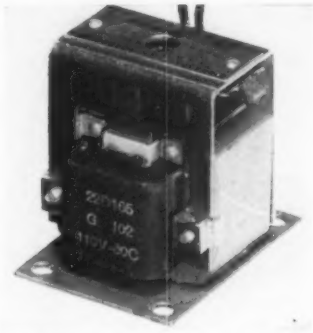
PRECISION SWITCH — *Unimax Switch Div., W. L. Maxson Corp., 460 W. 34th St., New York 1, N. Y.* A knurled knob on the Type MX-1-Z25 snap-acting precison switch, gives a variable differential motion. It may be fixed anywhere within the range of 0.0005 to 0.008 in.



FOOT SWITCH—*Pioneer Patents and Products Co., 25 N. Franklin St., Chicago 6, Ill.* Pioneer switches can be supplied in standard models, or quickly altered at the factory to suit any specifications.



PRECISION SWITCH—*Unimax Switch Div., W. L. Maxson Corp., 460 W. 34th St., New York 1, N. Y.* Type MXT-1-Z131 has a screw adjustment on the leaf actuator to compensate for tolerance variations in mass-produced assemblies.



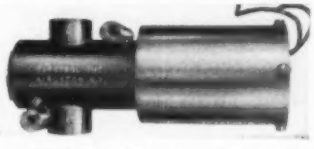
SOLENOID—*General Electric, Schenectady 5, N. Y.* Basic component of the device is a paper-layer-wound coil, a type that holds the voltage between turns to a minimum and greatly reduces the possibility of failure due to reduced voltage between layers of turns.

TIME SWITCH—*Henry G. Dietz Co., Box 248, Forest Hills, N. Y.* Electronic time switch provides a compact unit capable of meeting extreme flexibility in all types of timing operations.

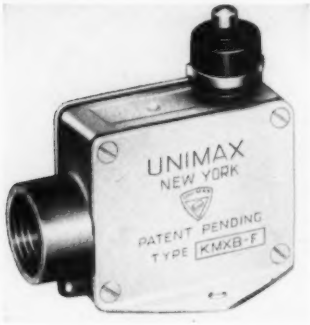
SNAP-ACTION SWITCH — *Electro-Snap Switch Div., The Exhibit Supply Co., 4218-30 W. Lake St., Chicago, Ill.* Completes the circuit for a small, predetermined part of the plunger's forward stroke, then gives release to the impulse as the plunger advances.

ELECTRIC SWITCHES — *Electro-Snap Switch Div., The Exhibit Supply Co., 4218-30 W. Lake St., Chicago.* Of small size and snap action wherein the switching action is independent of the speed of the actuator.

ELECTRIC SWITCH—*McRae Valve Corp., 620 S. Main St. Los Angeles 14, Calif.* Designed to automatically shut off electric equipment in the event of a severe explosion or earth shock.



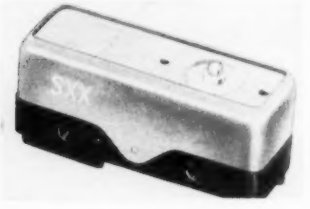
SOLENOID VALVE — *Electrol Inc., Kingston, N. Y.* Poppet-type solenoid valve, can be obtained in either normally opened or normally closed models, for use with oil, air, or water to pressures up to 1500 psi.



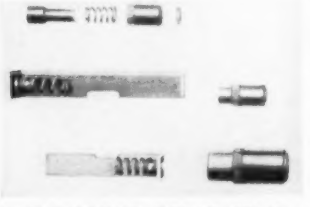
SWITCH—*Unimax Switch Div., The W. L. Maxson Corp., 461 W. 34th St., New York 1, N. Y.* A Neoprene boot and Neoprene side gasket seal the metal case of the KMXB snap-acting precision switch, protecting it from moisture, dust, and splashing oil and water.

HYDRAULIC ELECTRIC SWITCH — *Hydraulics Division, Pantex Mfg. Corp., Box 660, Pawtucket, R. I.* Cartridge-type electric switch is designed for precise control of electric circuits by means of hydraulic-pressure actuation.

SWITCH—*Unimax Switch Div., The W. L. Maxson Corp., 460 W. 34th St., New York 1, N. Y.* The type MXR precision switch is capable of absorbing over-travel up to $\frac{7}{8}$ in. A threaded bushing provides for single-hole mounting.

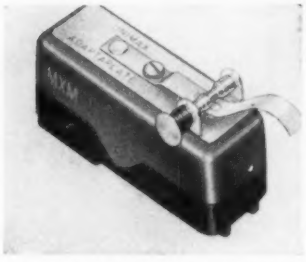


SWITCH—*W. L. Maxson Corp., 460 W. 34th St., New York 1, N. Y.* Type SXX precision switch is rated at 15-amps, 250-v ac; 20-amps, 120-v ac; $\frac{3}{4}$ hp, 125-, 250-, 460-v ac. Can be adapted for leaf, leaf-roller, hinged, plunger, push-on, push-off, and other actuating means.



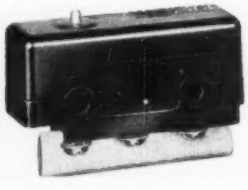
OVERCURRENT RELAY—*Westinghouse Electric Corp., 306 Fourth Ave., P. O. Box 1017, Pittsburgh 30, Pa.* Relay is said to have the most inverse current-time characteristic available. It coordinates with fuse curves over a wider range of currents than previous types.

RELAYS — *Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.* Relays for dc current furnish protection against overcurrent, undercurrent, and reverse current.



SAFETY INTERLOCK — *Unimax Switch Div., W. L. Maxson Corp., 460 W. 34th St., New York 1, N. Y.* Safety interlock for high-voltage equipment is built so circuit can be manually reclosed for testing, with no danger of being found "hot" later.

SOLENOID CONTROL VALVE — *C. B. Hunt and Sons, Inc., Salem, Ohio.* SA control valves employ a small solenoid, traveling through a $\frac{1}{8}$-in. stroke, to move a small pilot-valve plunger applying air to the operating piston to move the main-valve plunger.

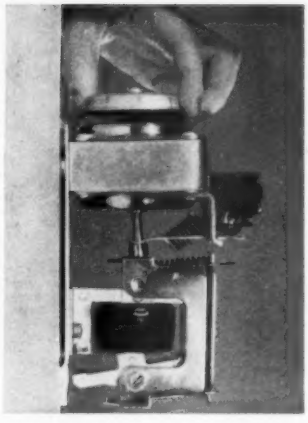


DOUBLE-THROW SWITCH — *Micro Switch, Freeport, Ill.* Small-size plastic-case switch which simultaneously makes and breaks two separate circuits has 5-amp, 28-v dc inductive-load rating.

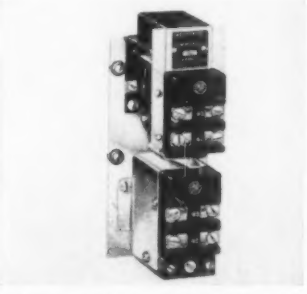
SAFETY SWITCHES—*Square D Co., 6060 Rivard St., Detroit 11, Mich.* Available in 100- and 200-amp sizes. Current-carrying parts of the switches are silverplated.

DELAY TIMER—*Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.* This resetting delay timer is said to answer many requirements for a dependable, simple, synchronous motor-driven time delay.

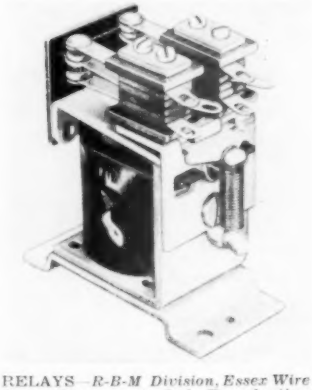
MERCURY-PLUNGER RELAY — *Ebert Electronics Corp., 185-09 Jamaica Ave., Hollis 7, L. I., N. Y.* A design using two standard EMT tubes in one coil structure is said to be an efficient arrangement for loads up to 35-amp, 115-v ac or 25-amp, 220-v ac.



TIME-DELAY RELAYS — *Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.* The large graduated dial of the AM pneumatic time-delay relay permits adjustment throughout the entire range.



TIMING RELAY—*Allen-Bradley Co., Milwaukee, Wis.* Adjustable timer utilizes a synthetic rubber bellows for controlling the tripping time. The range is adjustable from 10 cycles to 3 min with an accuracy of ± ten %.

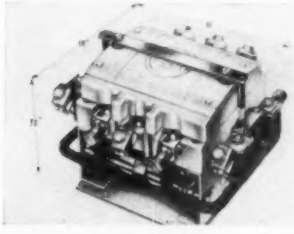


RELAYS—*R-B-M Division, Essex Wire Corp., Logansport, Ind.* By adapting a longer frame and larger coil bobbin to the 97000 Series relays, this design offers higher contact pressures and more coil power.

ELECTRONIC RELAY — *Servo-Tek Products Co., 4 Godwin Ave., Paterson 1, N. J.* Relay makes possible the use of ordinary electrical meters as primary activating sources or control and alarm applications. Utilizes cold-cathode gas tubes.

PNEUMATIC RELAY — *Moore Products Co., Philadelphia 24, Pa.* The cut-off point on this pneumatic relay for air-electric switches and other equipment requiring accurate, high-speed operation, can be set for any pressure between 0 and 35 psi.

SMALL RELAY—*Sigma Instruments, Inc., Boston 21, Mass.* Hermetically sealed, it measures 1-in. square by 1¾-in. high, exclusive of the terminals. It can be furnished with a second pole on the switch structure.

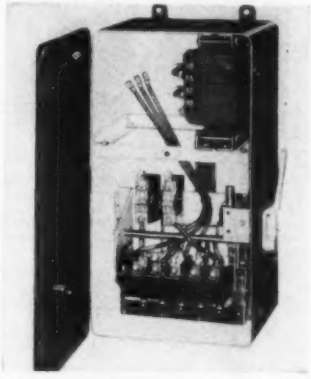


MAGNETIC STARTER—*The Arrow-Hart & Hegeman Electric Co., Hartford 6, Conn.* Compactness is achieved in this size-4 RA by a right-angle balanced mechanism, which employs full magnetic power without lifting extra weight.

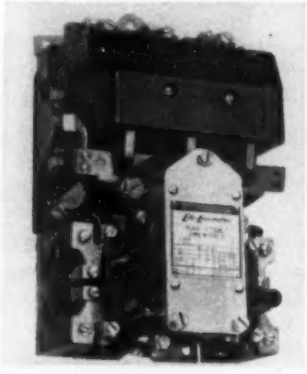
MOTOR STARTER — *Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.* Said to be especially suited for controlling and protecting small motors, the Motor Sentinel fits any standard 2½-in. wall box. Has a front-removable heater.

MOTOR STARTERS—*Square D Co., Industrial Controller Div., 4041 N. Richards St., Milwaukee 12, Wis.* Sizes 0, 1, and 2 open contactors and starters are made with standardized mounting dimensions, and are designed to conform to latest NEMA standards for industrial control.

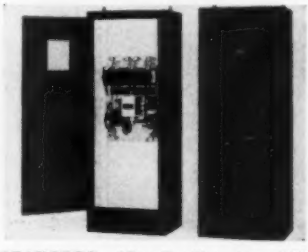
STARTERS—*Ward Leonard Electric Co., Mount Vernon, N. Y.* Bulletin 4120, combination magnetic starters with disconnect switches, are for use where this arrangement is preferable to separately mounted components.



MOTOR STARTER — *Allen-Bradley Co., Milwaukee, Wis.* Manual auto-transformer starter for squirrel-cage motors has two automatic-reset overload relays and is available in four sizes from 5 hp., 220-440-550 v., to 250 hp., 440-550 v; for 25, 50, and 60 cycles.



MAGNETIC STARTER — *Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.* The ac De-ion Life-Line starter has only one moving part, a "seesaw" lever balanced on a knife-edge bearing or center fulcrum.

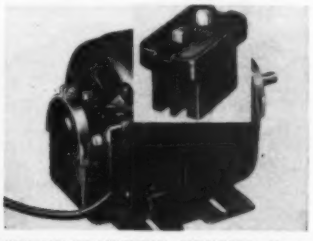


STARTERS—*Allen-Bradley Co., Milwaukee, Wis.* Sizes 6 and 7 ac across-the-line solenoid starters have one-piece magnetic plungers which operate with a vertical straight-line motion. Inclosed contacts require no cleaning.

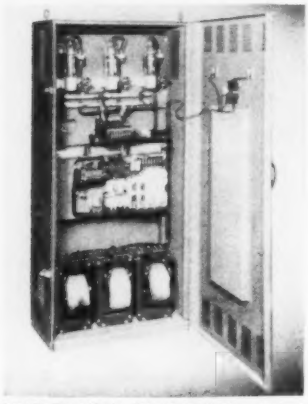
STARTER — *Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.* The Life-Linestarter, Class 11-206-N, combines motor starter, motor protection, and disconnect in a redesigned enclosure to save space and increase safety.

STARTER—*General Electric, Schenectady 5, N. Y.* This combination starter conforms to automotive JIC standards. A drip channel prevents liquids from entering around the door.

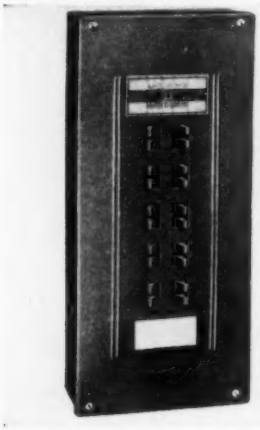
MOTOR STARTING RELAY—*R-B-M Division, Essex Wire Corp., Logansport, Ind.* Relay is a current type, having a balanced-armature construction which does not restrict mounting.



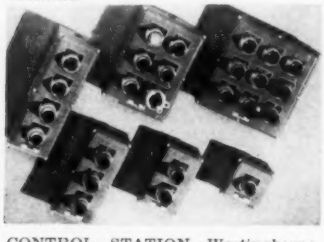
MOTOR-STARTING SWITCH—*Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.* The Klixon C9150 switch starts and stops motors, protects them from over-heating and burning out. Incorporates two sets of normally opened contacts and a Klixon manual reset protector.



ELECTRONIC RECTIFIER—*Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.* Floor- or wall-mounted electronic-rectifier units are mounted in factory-assembled inclosures to simplify installation, and to facilitate inspection and maintenance.



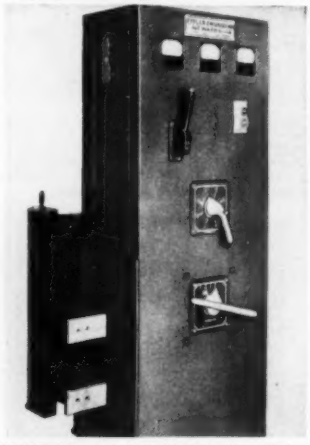
LOAD CENTER—*Square D Co., 6060 Rivard St., Detroit 11, Mich.* The MO-20 multi-breaker load center has the bus segregated in order to allow the control of all lighting circuits by a main breaker while other heavier circuits are controlled by parallel main breakers.



CONTROL STATION—*Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.* Control stations and units are specially designed for machine-tool control and other heavy-duty installations and can be used in any desired combination in the stations.

MOTOR CONTROL—*Square D, Industrial Controller Div., 4041 N. Richards St., Milwaukee 12, Wis.* A motor-control accessory to provide automatic restarting of a motor after a momentary voltage fluctuation.

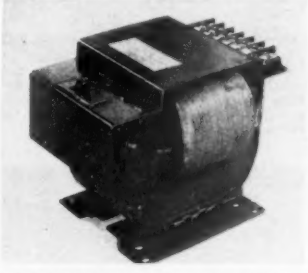
CONTROL CENTER—*Square D. Co., 4041 N. Richards St., Milwaukee 12, Wis.* Up to six, size -1 or -2 starters for this control center can be mounted in a vertical section 20-in. wide by 20-in. deep by 90-in. high.



HEATING TRANSFORMER—*Eisler Engineering Co. Inc., 750 S. 13th St., Newark 3, N. J.* Low-voltage, heavy-current transformer, complete with control panel, is available in any required combination of voltages and frequencies.

SELENIUM RECTIFIERS—*General Electric Co., 1 River Road, Schenectady 5, N. Y.* Oil-immersed selenium rectifier is especially designed for electroplating. It has hermetically sealed selenium stacks to withstand the corrosive atmosphere of the plating room.

TRANSFORMER—*Superior Electric Co., Hannon Ave., Bristol, Conn.* Explosion-proof model has been added to line of Powerstat variable transformers. Totally enclosed in a case which will withstand internal gas or vapor explosions.



TRANSFORMERS — *Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.* A grain-oriented magnetic-steel Hipersil core reduces size and weight and is said to improve performance of this machine-tool-control transformer.

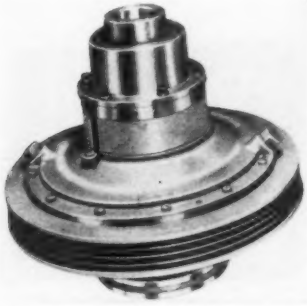
SWITCHBOARD INSTRUMENTS — *General Electric, Schenectady 5, N. Y.* Designed for application where long-range readings must be taken. The 8¾-in. instruments employ 250° scales, 14.2-in. long for legibility.

DEMAGNETIZER—*General Electric, Schenectady 5, N. Y.* This instrument is said to be highly effective in demagnetizing materials and stabilizing magnetic flux.

ELECTROMAGNETIC CLUTCHES—*Eaton Mfg. Co., Cleveland 10, Ohio.* Dry graphite powder is employed to produce friction without wear in these electromagnetic clutches and brakes.

PART DEMAGNETIZER — *Dings Magnetic Separator Co., 4740 W. Electric Ave., Milwaukee, Wis.* Demagnetizer, for precision parts, provides a convenient method for overcoming dangers of chips or magnetic dirt adhering to parts and causing scoring or failure of close-tolerance machinery.

TIMER — *Photoswitch Incorporated, 77 Broadway, Cambridge 42, Mass.* Electronic timer Series 30 is recommended for process control and machine timing when long life, repeat-cycle operation, or precise accuracy is desired.

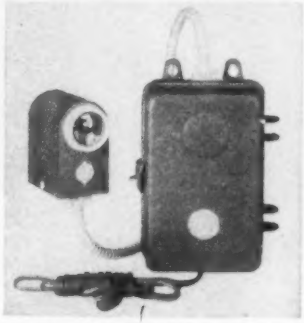


MAGNETIC PARTICLE CLUTCH—*Vickers Electric Div., Vickers, Inc., 1815 Locust St., St. Louis, Mo.* Called the Magneclutch, this coupling utilizes the action of a dry magnetic mixture in a magnetic field to link driving and driven parts.

TERMINAL BOARD—*General Electric, Schenectady 5, N. Y.* For switchboards, control apparatus, and other similar uses. It is rated at 600 v, 30 amp and is available in 4, 6, 8 and 12 terminal units.

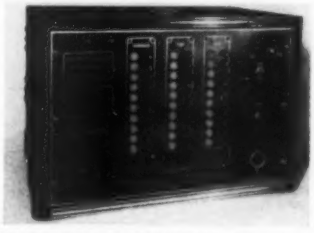
SOUND PROBE—*Como-Tex Co., 128 W. Lake St., Chicago 1, Ill.* Electronically controlled sound probe is said to localize and amplify sounds, immediately revealing their true character, whether normal or foreign.

COUNTERS—*Streeter-Amet Co., 4101 N. Ravenswood Ave., Chicago 13, Ill.* The model SCI industrial counter can be actuated by any electrical pulse or signal from a contact switch, phototube and amplifier, or metal detector.



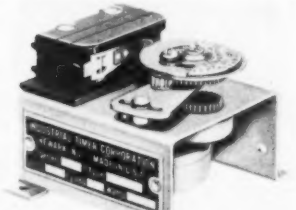
PHOTOELECTRIC COUNTER — *Photoswitch Inc., 77 Broadway, Cambridge 42, Mass.* No wiring is necessary in this photoelectric-counter set. The control is powered through line cord with a male plug connection which fits any standard lighting outlet.

MAGNETIC SEPARATOR — *Dings Magnetic Separator Co., 4740 W. Electric Ave., Milwaukee 46, Wis.* Removes miscellaneous tramp iron from wet or dry material in process.

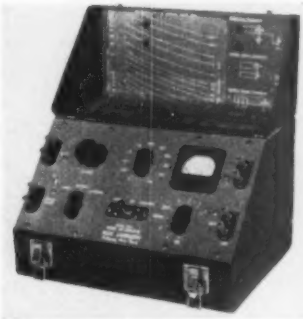


ELECTRONIC COUNTER—*Ferguson Machine & Tool Co., Inc., 471 Paul Ave., Ferguson Station, St. Louis 21, Mo.* With this counter, length of runs on certain operations can be determined and preset to any number from 1 to 999 by pushbutton keyboard.

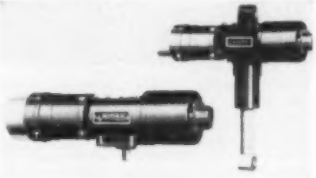
OVERSPEED GOVERNOR—*Synchro-Start Products, Inc., 1046 W. Fullerton Ave., Chicago 14, Ill.* Changes shutdown speed while running. It is adjustable to decrease or increase the speed.



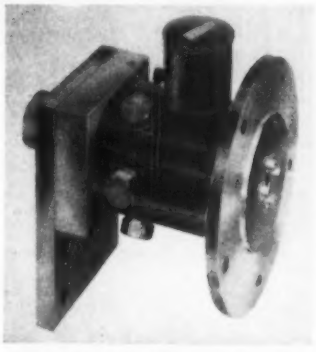
TIMERS — *Industrial Timer Corp., Newark, N. J.* Cam recycling timer is designed to repeat definite electrical on-and-off time cycles. Fifty different over-all time cycles can be obtained from one of these units.



BRIDGE—*Ellis Associates, Research and Equipment, Box 77, Pelham 65, N. Y.* Operated in conjunction with SR-4 gages and a cathode-ray oscilloscope the BA-1 bridge and amplifier provides a versatile system, adaptable to measuring practically any mechanical reaction.



ACTUATORS — *Airborne Accessories Corporation, 25 Montgomery St., Hillside 5, N. Y.* Rotary and linear models operating directly from 110-volt, 60-cycle, single-phase ac. They are still available for low-voltage direct current for which they were designed.

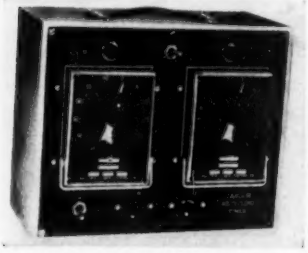


COLLECTOR HEAD — *Sciaky Bros. Inc., 4915 W. 67th St., Chicago 38, Ill.* Collector head, for transmitting high currents from a stationary to a rotating member, is said to replace copper-carbon brushes, used in transmitting current in electroplate tinning.

POWER-OUTLET BOX — *Sun Radio & Electronics Co., 122-124 Duane St., New York, N. Y.* Makes possible the plugging in of eight standard Edison line-cord plugs from one outlet.

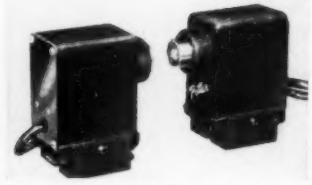
MAGNETIC CLUTCH — *Barber-Colman Co., Rockford, Ill.* Designed for servos and other devices where rapid engagement and release is required, this magnetic clutch has capacity of 0.2 hp with an input of 3 watts.

ELECTRONIC COMPUTER — *Potter Instrument Co., 136-56 Roosevelt Ave., Flushing, L. I., N. Y.* "Time-study computer" simulates machine and operator actions through electronic tubes. It calculates the production on each machine of a group, and the waiting time.

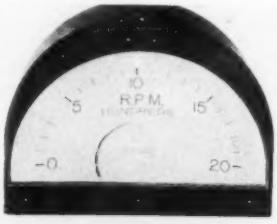


RECYCLING TIMER — *Industrial Timer Corp., Newark, N. J.* Automatic timing device enables the time cycles of two successive production operations to be accurately controlled for infinite periods without need for further adjustment, subsequent to initial setting.

METAL IDENTIFIER—*Electrochemical Instrument Laboratory, 532 Woodland Ave., Mountainside, N. J.* A portable metal identification instrument, known as Electrospot, makes use of the inherent differences in the surface films on metals to separate them by electrolytic means.



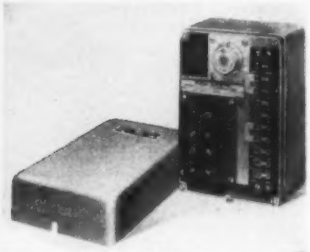
COUNT DETECTOR—*Potter Instrument Co., 136-56 Roosevelt Ave., Flushin, N. Y.* Photoelectric count detectors are completely sealed and provide the pulse output required to operate high-speed electronic counters.



INSTRUMENTS — *Cole Instrument Co., 1320 South Grand Ave., Los Angeles 15, Calif.* Instruments with a large, 28¼-in. scale, and a spot-of-light pointer are designed for applications where readings must be taken from a considerable distance.

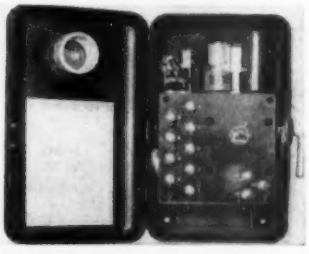
RETRACTABLE COILS — *Koiled Kords, Inc., Box K, Hamden, Conn.* Snarled electrical connections are all but eliminated on machinery with moving parts by cords that extend to five times their retracted length.

ELECTRIFICATION SYSTEM — *The Forker Corp., 2024 Random Road, Cleveland 6, Ohio.* A system for three-phase operation with capacities to 600 volts at 75 amp is reported to reduce arcing and flashing of conductor bars.



ELECTRONIC TIMER — *General Electric, Schenectady 5, N. Y.* Compact electronic timer provides automatic control of operation, limit and sequence timing.

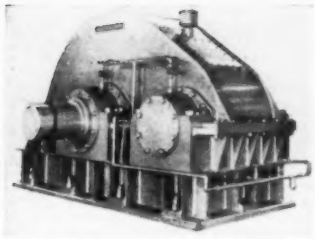
WIRE STRIPPER—*Rush Wire Stripper Div., The Eraser Co., Inc., 104 S. State St., Syracuse 2, N. Y.* Stripper uses the principle of friction-generated heat to melt enamel and Formex-type insulations.



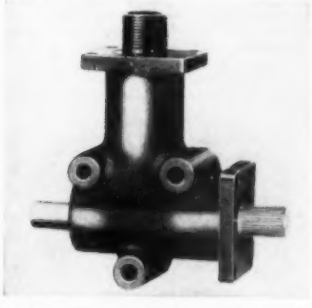
PHOTOELECTRIC CONTROLS—*Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.* Series 20 controls are recommended for such applications as counting and conveyor controls. It is available with phototube integral with the control or located in a separate housing.

SPLICE CAPS—*Buchanan Electrical Products Corp., 1290 Central Ave., Hillside, N. J.* For pigtail splicing of electrical wires. Available in an open-end construction which is claimed to facilitate their installation and inspection.

POTENTIOMETER — *Electro-Mec Laboratory, 225 Broadway, New York 7, N. Y.* Of ultra-low torque, it is primarily for use as an instrument component. It is being offered with a shaft torque as low as 0.003 in.-ounces.



SPEED REDUCERS — *Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.* Single- and double-reduction reducers known as the WSH and the WDH. Gearing is of the standard AGMA hobbed double-helical type, with a high helix angle.



RIGHT-ANGLE GEAR—*Airborne Accessories Corp., 25 Montgomery St., Hillside 5, N. J.* This right-angle gear unit, recently redesigned for universal mounting, includes a rectangular, 4-hole mounting flange with an internal pilot on both ends of the housing.

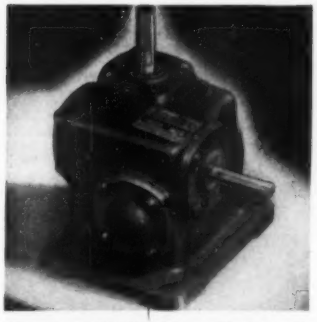
SPEED REDUCER—*Jensen Brothers Mfg. Co., Coffeyville, Kansas.* Named the Geartork, it consists of a system of planetary gears mounted in a cast semi-steel frame. The electric motor is bolted directly to this frame, the speed reducer and motor making a compact unit.

SPEED REDUCER—*Falk Corp., Milwaukee 8, Wis.* The all-steel housing design on this concentric-shaft speed reducer is said to provide more rigidity, greater strength, and improved appearance.

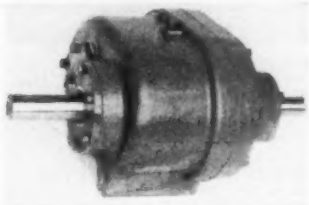
GEAR MOTORS—*Abart Gear & Machine Co., 4828-36 W. 16th St., Chicago 50, Ill.* Output speeds from 17.5 to 302 rpm and ratios of 5 4/5:1 to 100:1 can be obtained by this line of Abart right-angle gear motors.

GEARSHIFT DRIVE — *The Lima Electric Motor Co., Dept. AA91, Lima, Ohio.* Type R3C combines an electric motor with a four-speed transmission having both primary and secondary gear reductions.

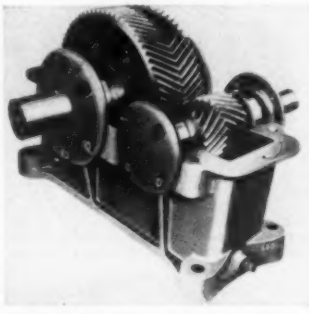
GEARSHIFT DRIVE — *The Lima Electric Motor Co., Lima, Ohio.* Selective-speed gearshift-drive line. Incorporates both primary and secondary gear reductions.



SPEED REDUCERS — *Winfield H. Smith Corp., Springfield, N. Y.* Totally inclosed in a single-piece housing, the DBRA is stocked in 24 different right-angle-drive assemblies and is offered in a range of 1/20 to ⅓ hp, and reduction ratios of 25:1 to 1764:1.

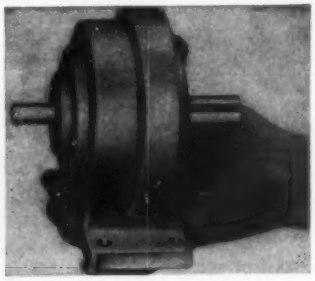


AUTOMATIC TRANSMISSION—*Western Mfg. Co., 4900 Scotten Ave., Detroit 10, Mich.* The mechanism in this Western two-speed automatic transmission consists of two overrunning clutches, one engaging in a clockwise, the other in a counter-clockwise direction.

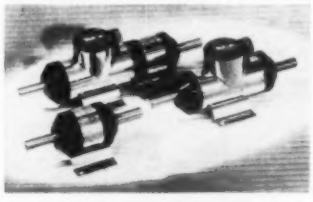


SPEED REDUCERS—*De Laval Steam Turbine Co., Trenton 2, N. J.* IMO-De Laval herringbone speed reducers are available in single-, double-, and triple-reduction units of ½ to 1000 hp. Center distances range from 4 to 36 in.

RIGHT-ANGLE DRIVE — *Airborne Accessories Corp., 25 Montgomery St., Hillside, N. J.* A 1-hp model of the ANGLgear box for either manual or power-operated systems. Shaft diameters are ⅝ in.

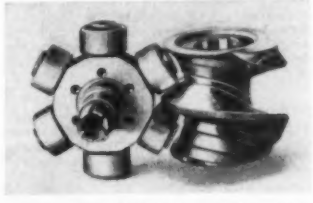


SPEED REDUCER — *Universal Gear Corp., 19th and Martindale, Indianapolis 7, Ind.* Heliocentric speed reducer features the use of anti-friction ball bearings, and quiet operation and lower cost due to a reduction in the number of working parts.



MINIATURE DRIVES—*Metron Instrument Co., 432 Lincoln St., Denver 9, Col.* Models having a variable and a fixed ratio are being combined for low-power applications requiring both speed reduction and variable speed.

GEARMOTOR—*Janette Manufacturing Co., Chicago, Ill.* Developed for combustion-control systems, the BO gearmotor uses double-reduction worm gearing to furnish an output speed of 0.4006 rpm, and 220 lb-in. of output torque.



INTERMITTENT-MOTION DRIVE—*Ferguson Machine & Tool Co., Inc., 471 Paul Ave., Ferguson Station, St. Louis 21, Mo.* High-speed drive is unidirectional in operation, and provides precise position locking during rest, eliminating additional locking and locating devices.

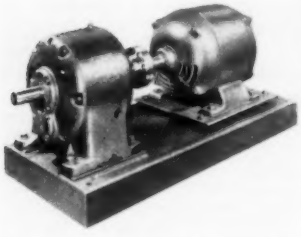
TRANSMISSION—*Western Mfg. Co., 5400 Scotten Ave., Detroit 10, Mich.* Model-420 has gears and shafts of alloy steel, heat-treated, and with the gears shaved. The revolving shafts are mounted on anti-friction bearings.

VARIABLE-SPEED TRANSMISSION—*Graham Transmissions, Inc., 3754 N. Holton St., Milwaukee 12, Wis.* Speeds from maximum to zero can be obtained on the Model 300.

SPEED CHANGERS—*Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.* Precision-hobbed gears of 96 dp are available in the Metron line of miniature speed changers.

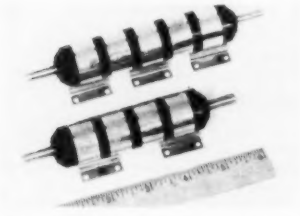
TRANSMISSION—*Revco, Inc., Dept. AM, Minneapolis, Minn.* Model 14R transmission gives infinite speed variation from 0 to 425 rpm at 1750-rpm input speed, both forward and reverse.

TRANSMISSION — *Cushman Motor Works, Inc., Lincoln, Neb.* Varimatic transmission provides, through an automatic clutch, a throttle-controlled speed change varying between a 3:1 reduction in low to a 0.95:1 overdrive in high.



HELICAL-GEAR DRIVE — *Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.* With separate standard motor, flexibly coupled and mounted on a welded-steel base plate. A movable plate between the motor feet and the base plate provides for convenient adjustment, should shaft realignment be necessary.

TORQUE CONVERTER—*Revco Inc., Dept. AM, 405 Thorpe Bldg., Minneapolis 2, Minn.* This Zero-Max torque converter has a rating of 20 in.-lb, provides full torque conversion at all speeds and infinitely variable speeds from zero to ¼ the input motor speed.

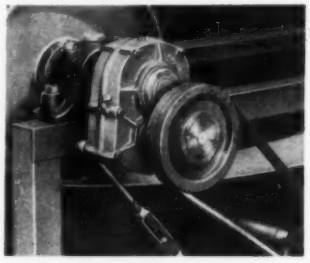


SPEED CHANGERS—*Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.* Gear reductions as high as 75,000 to 1 are available in this line of miniature speed changers.

CLUTCH—*E. W. Bliss Co., 1420 Hastings St., Toledo 7, Ohio.* Type L pneumatic friction clutches, are said to offer advantages such as the safety and control features of the Bliss electrical-control system.

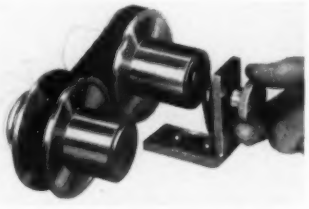
CLUTCH COUPLING—*Centric Clutch Co., 22-26 South Ave. West, Cranford, N. J.* Coupling is adjustable on the job for various hp requirements and can accommodate shafts from ⅝ to 1¾ in. diam with standard keys.

REDUCTION CLUTCH — *Snow-Nabstedt Gear Corp., Hamden, Conn.* Said to be the most compact clutch available, this reduction clutch is 9⅜-in. long, 9¾-in. wide, and 10 13/16-in. high.



SPEED REDUCER — *Dodge Mfg. Corp., Mishawka, Ind.* The Torque-Arm speed reducer mounts directly on driven shafts and, through the use of stock sheaves, provides any output from 13 to 133 rpm.

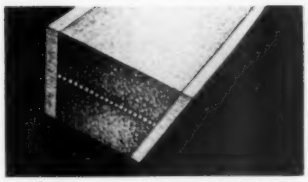
VARIABLE-SPEED PULLEY—*Frazier & Son, 538 Cortlandt St., Belleville, N. J.* Set by knob or remote control. An automatic speed-locking device keeps the pulley in the desired position anywhere in the 3 to 1 ratio.



VARIABLE-SPEED SHEAVES—*Speed Selector, Inc., 118 Noble Court, Cleveland 13, Ohio.* Speed-selector combination sheaves produce wide variations of speed between fixed-center shafts through use of standard V-belts.

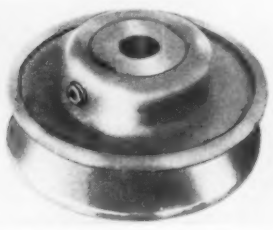
SHEAVE LINE—*Allis-Chalmers Mfg. Co., Milwaukee, Wis.* Has been extended to include A-B combination groove sheaves in sizes from 3 to 38 in. with 1 to 6 grooves in both collar and no-collar models.

PULLEY—*American Type Founders, 200 Elmora Ave., Elizabeth 8, N. J.* Adjust-O-Matic pulleys, designed for drives of ¾ and 1 hp, provide speed ranges of 3:1 in the plastic models equipped with steel-faced sheaves. An aluminum alloy model delivers a 2:1 range on drives of 1, 1½, and 2 hp.



V-BELTS—*Charles A. Schieren Co., New York, N. Y.* V-Belts for single- and multiple-belt drives, are said to have greater resistance to stretch than many cotton-cord belts. They are made of leather with a row of rayon cords bonded between the leather plies.

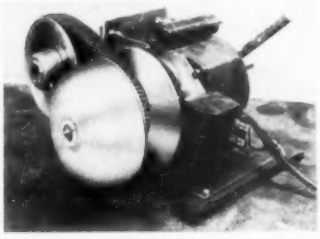
V-BELT SHEAVE — *The American Pulley Co., 4200 Wissahickon Ave., Philadelphia, Pa.* The taper bushing and taper sleeve on this V-belt sheave are said to provide easy mounting and dismounting as well as rigid locking and elimination of vibration, wear, and corrosion.



PULLEYS — *The Climax Flexible Coupling Co., 863 E. 140th St., Cleveland 10, Ohio.* A line of V-belt pulleys and variable-pitch pulleys manufactured from high-grade cast iron. The bore and grooves are completely machined at one chucking.

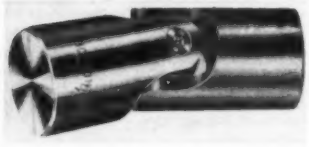
MAGNETIC PULLEYS—*Eriez Mfg. Co., Erie, Pa.* Permanent-magnet pulleys have been redesigned to provide increased magnetic power, lighter weight, and greater structural strength.

VARIABLE-PITCH PULLEY — *Gerbing Mfg. Corporation, 650 W. Washington Blvd., Chicago 6, Ill.* Roto-Cones, available in the 2- and 3-hp range, Models 1050-20 and 1050-30. The line includes sizes from ⅛ to 10 hp.



CLUTCH PULLEY—*Driv-way Lite Co., P. O. Box 2850, Denver, Colo.* Automatic variable-speed clutch pulley which is controlled by engine speed makes possible infinite gear-ratio changes.

TELESCOPING SLEEVE — *A & A Mfg. Co., 2017 W. Clayboum, Milwaukee 3, Wis.* Made of a special combination of rubber fabric and Fortite, these telescoping sleeves, for protecting moving parts, are non-hygroscopic, impervious to oil and water, and are of uniform thickness.

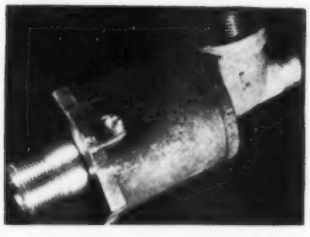


UNIVERSAL JOINT — *Boston Gear Works, Quincy, Mass.* This joint is designed for high load-carrying capacity and high static-torque rating. It equals or exceeds government specifications set up for aircraft.

FLEXIBLE COUPLING — *Gerbing Mfg. Corp., Roto Cone Variable Speed Pulley Div. Northbrook, Ill.* A flexible coupling that employs a rubber insert is another method of licking the misalignment problem in shafts.

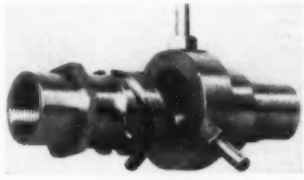
SPLINE COUPLING — *Ajax Flexible Coupling Co., Inc., Westfield, N. Y.* This flexible coupling handles angular and offset misalignment up to 7° with a standard coupling, and special models for handling up to 12°.

COUPLING—*The Falk Corporation, Milwaukee 8, Wisconsin.* Improvement in rubber composition and bonding are said to have increased torque capacity of the Airflex coupling 20% over previous values.



ROTARY JOINT — *The Phillips Rotary Joint & Valve Co., Inc., Hoboken, N. J.* Liquids or steam may be transferred into or out of any revolving drum or roller by this rotary flexible joint.

PIPE COUPLING—*Gil-Lair Products, Inc., 81 Masonic Court, Pasadena 3, Calif.* The All-Flex ball-bearing swivel pipe-coupling handles fluids under high pressures through a pipe that rotates a full 360° in all planes.



HOSE-LINE COUPLING — *Sperry Products, Inc., Danbury, Conn.* Self-sealing coupling, made in various types and sizes, is a connector for gas or liquid pipe and hose lines. It has a quick disconnect convenience, and automatically seals both line ends when disconnected.

SWIVEL-PIPE JOINT — *Barco Mfg. Co., Dept. 11, 1801 W. Winnemac, Chicago 40, Ill.* By eliminating wedge action of the ball against the gasket, the turning torque in this joint is almost completely eliminated. The ball is held in place by a Belleville spring.

CHECK VALVES—*James-Pond-Clark, Pasadena, Calif.* These check valves utilize a synthetic-rubber O-ring between conical surfaces on the poppet and valve housing.

O-RING SEALS—*Minnesota Rubber & Gasket Co., 3630-A Wooddale Ave., Minneapolis 16, Minn.* Closer dimensional tolerances, greater uniformity of production, and lower costs are said to be possible in the manufacture of O-rings by an injection molding process. Made of a synthetic-rubber compound.

GROMMET—*Automotive Rubber Co., Inc., 8601 Epworth Blvd., Detroit 4, Mich.* Steel and rubber grommets have curled prongs which are forced against the back surface of a blanked hole and provide a secure hold.

V-RING PACKINGS—*Crane Packing Co., Dept. G22, 1800 Cuyler Ave., Chicago 13, Ill.* These packings are claimed to combine the chemically inert and low-friction properties of Teflon with resilience and toughness needed for proper sealing results.

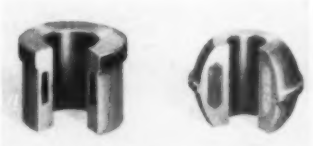
BALL BEARING — *New Hampshire Ball Bearings, Inc., Peterborough, N. H.* Anti-friction micro ball bearing has ¼-in. OD and a bore diameter of 5/64 in., both diameters held to tolerances of plus zero, minus 0.0002 in. from the nominal.

BEARING—*Nice Ball Bearing Co., Philadelphia, Pa.* An oil-resistant rubber-coated fabric in contact with a specially formed metal shield on the "Composition-Sealed" ball bearings are claimed to effectively retain lubricant and exclude foreign material.

MINIATURE BALL BEARINGS—*Landis and Gyr, Inc., 104 Fifth Ave., New York, N. Y.* Designated as the RO Series, they start at 0.0295 in. bore and 0.1181-in. OD. Finished with ball retainers.

MINIATURE BEARING—*New Hampshire Ball Bearings, Inc., X Key St., Peterborough 1, N. H.* This flanged ball-bearing is said to make possible substantial manufacturing economies, often permitting substitution of punched sheetmetal housings for precision-machined castings.

ROLLER BEARING — *Bearing Div., McGill Mfg. Co., Valparaiso, Ind.* This cageless roller bearing is said to eliminate skewing. The outer race is constructed with a tapered guide rail on the inside diameter, and a retaining ring is snapped over the opposite side of the roller grooves.



BEARINGS — *Michigan Powdered Metal Products Co., Inc., Northville, Mich.* The sintered-metal Oil Well bearings embody cavities of uniform size in the center of the bearing wall. As oil or grease is impregnated into the metal by static pressure, it fills the cavity as well as the pores in the body itself.

OIL-IMPREGNATED BEARINGS — *Boston Gear Works, 60 Hayward St., Quincy 71, Mass.* A porous-bronze line of bearings, cored bar, solid bar, and plate in a wide range of stock and sizes. Because of their porosity they carry their own oil reservoir.

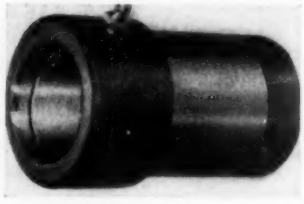
END BEARING—*The Heim Company, Fairfield, Conn.* The Unibal end bearing is designed for push-pull controls and linkages where it is necessary to correct for misalignment. Available with male or female threads, right or left hand.

LIGHT-DUTY BEARING—*The Fafnir Bearing Co., New Britain, Conn.* Designed primarily for light-duty, slow-speed anti-friction bearing application the Flangette is an arrangement of two pressed-steel stampings which form a flanged housing inclosing a ball bearing.

PILLOW BLOCKS—*Congress Drives Div., Tann Corp., 3750 E. Outer Drive, Detroit 34, Mich.* Manufactured in ½-, ⅝-, ¾-, and 1-in. bore sizes, self-aligning Lubralife pillow blocks are designed to handle heavier loads and higher speeds than conventional bearings.

BEARING PULLERS — *Plomb Tool Co., Los Angeles, Calif.* Additions to the line of Proto puller items include a bearing separator-puller plate, 14 step-plate adapters, two jaws, and two screw tips.

PULLERS—*Owatonna Tool Co., 383 N. Cedar St., Owatonna, Minn.* Have threads on the forcing screw which are said to provide 32% more power than the conventional V-type thread.



GUIDE BUSHINGS—*Lamina Dies & Tool, Inc., 14925 W. Eleven Mile Road, Barkley, Mich.* These bushings are of hardened steel with 0.001 to 0.002 in. of bronze electroplated on the inside-diameter bearing surface.

DRILL BUSHINGS—*S. & E. Machine Products, Inc., Bridgeport, Mich.* Solid-carbide drill bushings for 0.028- to 1.75-in. drill sizes are made to ASA standards and are 100% interchangeable with standard steel bushings.

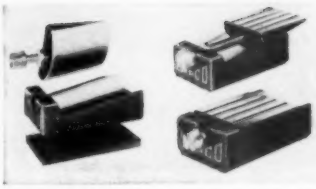
DRILL-JIG BUSHINGS — *Colonial Bushings, Inc., Detroit, Mich.* Made from an oil-hardened steel called Colonial No. 3 which is said to give many times the wear resistance of steels formerly used.

MICRO-DRILL-JIG BUSHINGS — *Micro Drill Guide and Engineering Co., 18515 Weaver Ave., Detroit 28, Mich.* In a line of over 1700 types. Bushings are from 0.0135 to 3/32 in., and in four standard body sizes (3/32, 1/8, 5/32, and 3/16 in). Liners for all body sizes are also included in the line.

CAMS — *Technical Metal Processing, Inc., East 55th St. at Lake Court, Cleveland 14, Ohio.* To reduce cam costs, even on relatively small lots, cams are made of stamped-steel laminations, stacked together and copper brazed into a single unit.

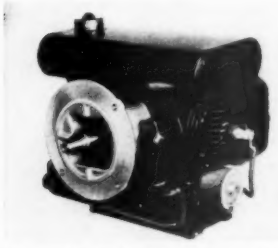
FLANGE—*Ahlberg Bearing Co., 3025 W. 47th St., Chicago 32, Ill.* Designed to meet the requirements of small-shaft equipment where light loads and normal speeds are imposed, this flange has internal self-aligning ball bearings.

CAPS—*Elastic Stop Nut Corporation, 2300 Vauxhall Rd., Union, N. J.* A high, light-weight, all-metal cap for some ESNA hex and anchor nuts has a red elastic collar. The cap forms a pressure seal against external or internal liquid and gas pressures of 80 psi.



JACKS — *Enterprise Machine Parts Corp., 2731 Jerome Ave., Detroit 12, Mich.* Machine-leveling jacks include Vi-Sorb vibration-absorbing mounting pads. Available in two models, with ¼ and ½-in. pads.

GASOLINE ENGINE — *Power Products Corp., Grafton, Wis.* Of 2 hp, it is said to be 20 lb lighter than others of similar power. Has vertical twin cylinders in lightweight aluminum.



ADAPTOR FLANGE — *Power Products Corp., Grafton, Wis.* With this adaptor flange, manufacturers of pumps, compressors, generators, and other equipment will be able to offer customers the option of either gasoline or electric power units.

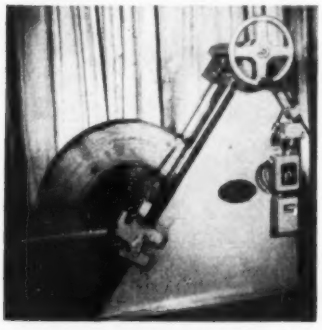
COPPER-BRAZED CRANKSHAFTS — *Technical Metal Processing Inc., East 55th St., Cleveland 14, Ohio.* With components made on punch press and screw machine, can frequently replace drop-forge construction without sacrifice of quality.

PLATING BARREL — *Hanson-Van Winkle-Munning Co., Matawan, N. J.* Mercil-type Merlon ribless cylinder for use with commonly employed plating solutions is said to hold 15% more work than conventional cylinders of the same size. Available in 14- and 30-in. sizes.

PLATING-BARREL CLAMP — *Hanson-Van Winkle-Munning Co., Matawan, N. J.* The Type C plating-barrel clamp is constructed of two parts which are both non-metallic, thus eliminating possible metal deposit build-up.

SPROCKET CHAINS — *Franklin C. Wolfe Co., 407 Commercial Center St., Beverly Hills, Calif.* Load-carrying chains and stud chains with non-corrosive and non-magnetic qualities designed for use around very small pulleys and sprockets.

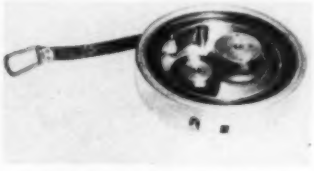
SPROCKET—*Chain Belt Co., 1600 W. Bruce St., Milwaukee 4, Wis.* The Baldwin-Rex tooth form, on this chain sprocket, is composed of a root circle, straight working faces tangent to the root circle, and topping curves which bring the tooth to a point. The longer tooth form will handle more pitch elongation.



AUTOMATIC COIL CRADLE — *U.S. Tool Co., Inc., Ampere, E. Orange, N. J.* Material up to 60 in. width and coils up to 40-in. OD and 1000 lb can be handled in the Model ACCI-640 coil cradle. The cradle is equipped with hardened-and-ground feed rolls, mercury-switch control, and a motor.

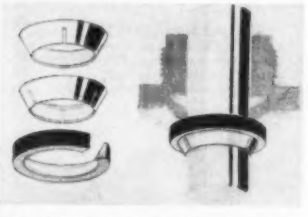
ELECTRIC-CORD REEL — *Aero-Motive Mfg. Co., 1803 Alcott St., Kalamazoo 24, Mich.* The Model SW-25 electric-cord reel incorporates a long opening on the cable outlet which is equipped with a roller at each end and heavy-side beading designed to increase cable life.

MANUAL STARTER — *Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.* An improved starter, the Motor Sentinel Class 10-023, is equipped with an indicating light which shows when the motor is running.



SPRING MOTOR—*Neg'ator Div., Hunter Spring Co., 1 Spring Ave., Lansdale, Pa.* Spring motors are being designed around an elastic member made from prestressed flat spring stock called the Neg'ator. The motors are characterized by a constant output torque, and a long running time.

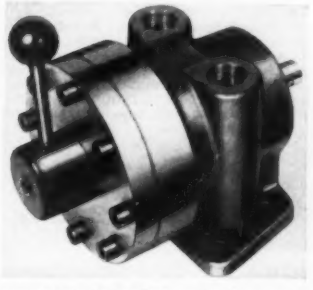
SPRING COILERS—*The Carlson Co., 277 Broadway, New York 7, N. Y.* Hand-operated units make compression, extension, and torsion springs. Setup time is less than 5 min.



ROD WIPER—*Hydraulic Accessories Co., 743 Beaubien St., Detroit 26, Mich.* Metallic rod wiper is for protection of hydraulic and pneumatic cylinders, shielding rods, and packings from abrasive foreign elements.

HYDRAULIC FLUID—*Campbell Oil Co., Cleveland, O.* Hydrauff No. 66 is a non-flammable petroleum liquid claimed to hold pressure well and to have high efficiency.

HYDRAULIC FLUID—*Monsanto Chemical Co., St. Louis 4, Mo.* Is said to have high lubricity, and to be a non-conductor of electricity.



HYDRAULIC PUMP — *Hydropower, Inc., Milwaukee, Wis.* Provides controlled hydraulic power. Variable or adjustable displacement is provided by a vaned construction without resorting to heat-generating relief valves.

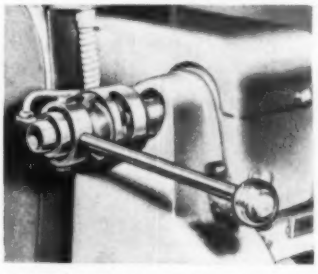
MIDGET PUMPS — *John Dusenbery Co., Inc., 271 Grove Ave., Verona, N. J.* Besides the 5-pint-capacity reservoir models previously put out, the line now includes units with 3-gal capacity reservoirs.

BOOSTER—*Miller Motor Co., 4027 N. Kedzie Ave., Chicago 18, Ill.* Fluid-pressure boosters that develop hydraulic pressures up to 10,000 psi are being offered in a range of sizes, pressure ratios, and mounting styles.

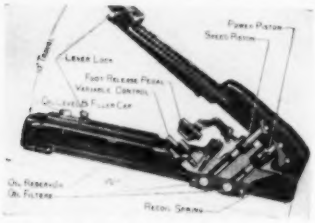
DOUBLE-SOLENOID VALVE—*Rivett Lathe & Grinder Inc., Brighton 35, Boston, Mass.* This four-way hydraulic valve is double-solenoid operated to semi-automatically control a hydraulic circuit. Located at each end of the valve body, the solenoids are of the push type.

RELIEF VALVE — *Hydraulic Equipment Co., Cleveland 17, Ohio.* This adjustable differential relief valve is designed for use in high-pressure, oil-hydraulic control systems. Design characteristics are said to eliminate valve chatter.

REDUCING VALVE—*Atlas Valve Co., 282 South St., Newark 5, N. J.* Handles working pressures as high as 6000 psi. Known as Type E, the main valve and seat are Stellite faced.

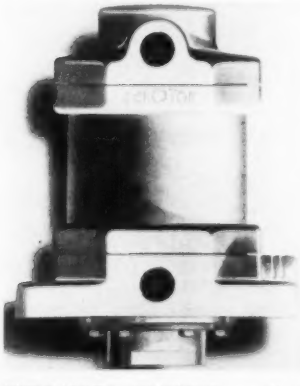


RELIEF VALVE—*Pantex Mfg. Corp., Pawtucket, R.I.* Precision hydraulic relief valve is available for pressure settings ranging from 100 to 5000 and opens and closes within 7% differential.

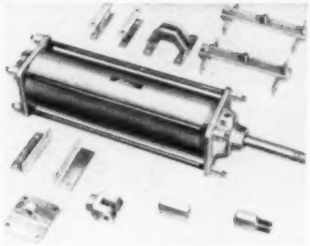


HYDRAULIC JACK — *Wihtol Industries, Lewis Street, Eatontown, N.J.* The Go-Jak foot-operated jack develops up to 20-tons force. The pedal forces the ram out quickly until the work is contacted, when the unit changes automatically from high to low speed.

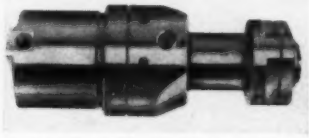
CYLINDER—*Hannifin Corp., 1118 So. Kilbourn Ave., Chicago 24, Ill.* Cup-type pistons and chevron-gland packings make these large-diameter cylinders suitable for air, oil, or water service.



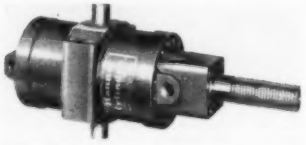
HYDRAULIC CYLINDER — *Rivett Lathe & Grinder, Inc., Brighton 35, Boston, Mass.* Piston rods in the Gerotor 2:1 cylinder are twice in diameter to that of standard rod size. Additional area reduces oil displacement within the cylinder.



HYDRAULIC-CYLINDER LINE — *Ledeen Mfg. Co., 1600 S. San Pedro St., Los Angeles 15, Calif.* Medium-duty air and hydraulic cylinders for applications where straight-line motion is used. Of tie-rod construction giving positive protection against leakage at joint of tube and head.

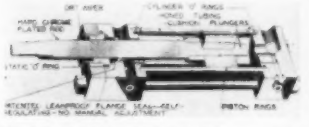


HYDRAULIC CYLINDERS—*Hannifin Corp., 1118 S. Kilbourn Ave., Chicago 24, Ill.* Hy-Power line of hydraulic cylinders is built especially for push-stroke applications using up to 5000 psi.

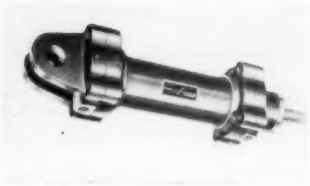


HYDRAULIC CYLINDER — *Hanna Engineering Works, Chicago, Ill.* Designed for working pressures up to 1500 psi, these hydraulic cylinders are available with 8 standard mounting styles.

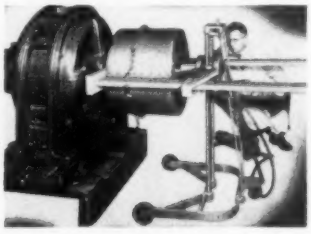
HYDRAULIC UNIT—*The Bellows Co., 222 W. Market, Akron, Ohio.* Model HC Hydro-Check is designed to control the feeding rate of air-fed cutting tools. It provides a maximum checking load of 12,000 lb, infinitely variable through a precision adjusting control.



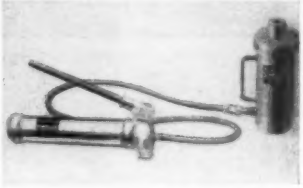
HYDRAULIC CYLINDER — *Miller Motor Co., 5027 N. Kedzie Ave., Chicago 18, Ill.* Hydraulic cylinders that meet the recently approved JIC hydraulic standards are available in a complete standard line from 1½- to 12-in. bores, for 2000- to 3500-psi operation.



OIL-HYDRAULIC CYLINDERS — *Vickers, Inc., 1410 Oakman Blvd., Detroit, Mich.* Improved cylinder-head seals, multiple piping-connection positions, universal mounting positions, special self-adjusting packings, and adjustable hydraulic cushions have been incorporated into the series LA hydraulic cylinders.

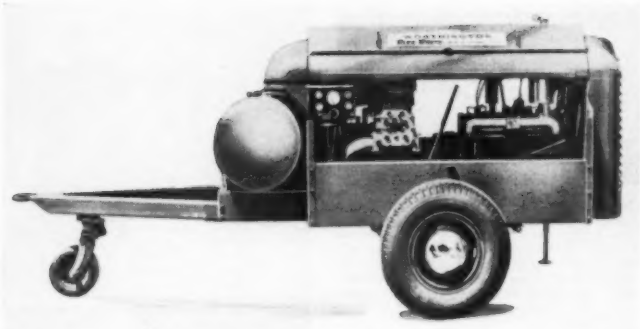


PULLEY PULLER—*Industrial Engineering Equipment Co., 122-124 E. Fourth St., Davenport, Iowa.* This heavy-duty portable pulley puller, for removing large pulleys, wheels, and gears from shafts, is actuated by a hydraulic jack. Pulleys as large as 42-in. dia with face width up to 48 in., can be handled.

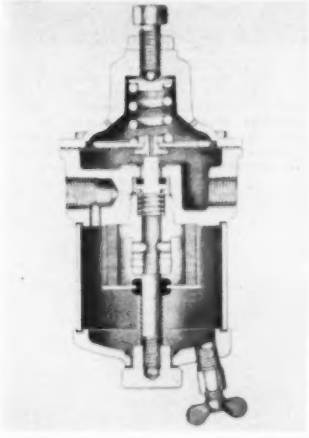


HYDRAULIC RAM—*Templeton, Kenly, and Co., Chicago, Ill.* Remotrol rams and pumps enable an operator to lift, pull, or push from a distance and in any direction.

AIR PUMP—*General Scientific Equipment Co., 2700 W. Huntingdon St., Philadelphia 32, Pa.* A safer, more economical, and faster way to remove acids and other corrosive liquids from stainless-steel containers is said to be offered by this air pump.



AIR COMPRESSOR — *Worthington Pump and Machinery Corp., Holyoke, Mass.* An improved 105-ft compressor has been built around the standard Blue Brute model. New features include a retractable zero-pressure third wheel.



FILTER—*Conoflow Corp., 2100 Arch St., Philadelphia 3, Pa.* A combination regulator, filter, and dripwell in a single unit is called the Airpak. It is constructed of brass and stainless steel and has a capacity of 25 cfm.

AIR-LINE FILTER — *A. Schrader's Son Div., Scovill Mfg. Co. Inc., 470 Vanderbilt Ave., Brooklyn.* No. 3084 features a filtering element composed of hundreds of laminations of a fine material.

ACCUMULATORS—*Miller Motor Co., 4027 N. Kedzie Ave., Chicago 18, Ill.* Accumulators operated by low-pressure air eliminate the danger of handling high-pressure gages, but store fluids up to 10,000 psi.

ACCUMULATORS—*Vickers Inc., 1410 Oakman Blvd., Detroit 32, Mich.* Unusually high-safety factor at 3000-psi pressure is said to be achieved by a swaged neck connection, and one-piece, seamless, alloy-steel shell construction.

AIR DRYER—*The Gasflux Co., Mansfield, Ohio.* For compressed air lines, combines the functions of an aftercooler and a mechanical dryer in a single unit.

AIR-LINE FILTER—*Keller Tool Co., Grand Haven, Mich.* Air-Line Filter has a two-piece aluminum housing and a porous, sintered-bronze, filter element.

AIR PURIFIER—*E. D. Bullard Co., 275 Eighth St., San Francisco 3, Calif.* Light enough to be classed as portable, this 6-outlet purifier has 10 to 35-cfm capacity at 100-psi max working pressure.

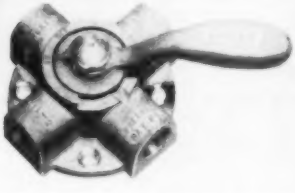
AIR VALVE — *The Beckett-Harcum Co., Wayne Road, Wilmington, Ohio.* The Hi-Cyclic valve is said to control the stroke of an air-cylinder within 0.001 in. The unit is a spool-type valve employing a stainless-steel piston with the valve body constructed of bronze bar stock.

AIR-CYLINDER VALVES — *Hanna Engineering Works, Chicago, Ill.* A line of Flo-Set speed-control valves features micrometer graduations for precise control of low-pressure cylinders.

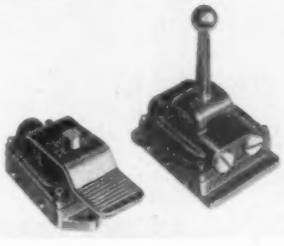
BUTTERFLY VALVES—*F. J. Stokes Machine Co., 5900 Tabor Road, Philadelphia 20, Pa.* For high-vacuum applications, they are said to require only a fraction of the space needed for diaphragm or plug valves of equivalent capacity.

CYLINDER VALVE—*Airmatic Valve Inc., 1643 E. 40th St., Cleveland, Ohio.* Corrosion-resistant valve operates at pressures up to 1500 psi for air, oil, or water service. Self-adjusting packings eliminate the possibility of damage due to improper hand adjustment.

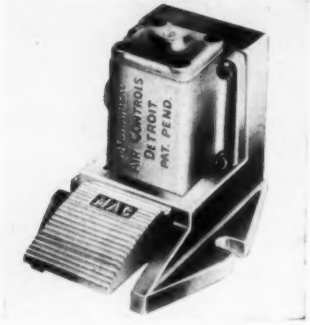
TIME-DELAY VALVE—*Ross Operating Valve Co., 120 E. Golden Gage Ave., Detroit 3, Mich.* For operation on all Ross in-line operating bodies from ¼ to 1¼ in. sizes, this valve operates by volume measurement of air.



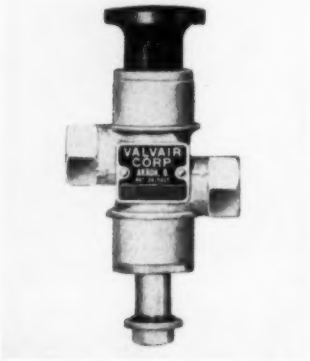
AIR VALVE—*Barksdale Valves, 4095 Santa Fe Ave., Los Angeles, Calif.* This manual four-way valve controls 150-psi air pressure and handles liquid pressures up to 100 psi.



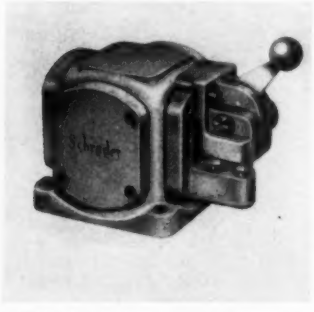
AIR VALVE—*Ross Operating Valve Co., 120 East Golden Gate Ave., Detroit 3, Mich.* Chief feature of this air valve is its flexibility due to interchangeability of parts.



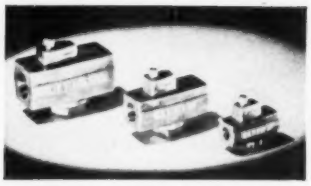
CYLINDER VALVES—*Mechanical Air Controls Inc., 3049 E. Grand Blvd., Detroit 2, Mich.* Mac foot valves are available in ⅜- and ¾-in. sizes in either locking or non-locking units. The treadle is designed to provide shortness and ease of stroke.



AIR-CONTROL VALVE — *Valveair Corp., 454 Morgan Ave., Akron 11, Ohio.* The body used is shock-resisting, high-tensile zinc alloy. They are knob-operated, two-way and three-way.

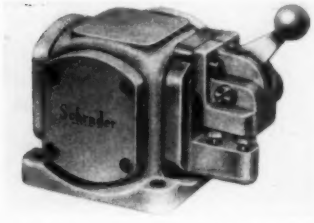


AIR VALVE—*A. Schrader's Son, Div. of Scovill Manufacturing Co., Inc., Brooklyn 17, N. Y.* This valve, for use with double-acting cylinders, is essentially two valves, one acting as a pilot. It is said to provide fingertouch control and is so constructed that piping can be concealed.



SPEED CONTROL VALVE—*Hannifin Corp., 1118 South Kilbourn Ave., Chicago 24, Ill.* An "O" ring seal above the threads on this speed-control valve for pneumatic cylinders permits air to escape well before the threads disengage, warning the operator that the point of maximum adjustment has been passed.

CYLINDER VALVE — *Valvair Corp., 454 Morgan Ave., Akron 11, Ohio.* When this valve is in neutral position all ports are blocked. It is then possible to stop and hold the piston of a single- or double-acting cylinder in any position.



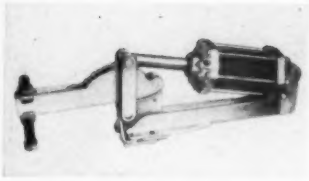
AIR VALVE—*A. Schrader's Son Div., Scovill Mfg. Co., Inc., 470 Vanderbilt Ave., Brooklyn 17, N. Y.* Four-way air-control valve is designed for base mounting with manifold pipe ports for concealment of piping.

AIR VALVE—*A. Schrader's Son, Div., Scovill Mfg. Co., Inc., 470 Vanderbilt Ave., Brooklyn 17, N.Y.* Designed primarily for use with Bantam air cylinders, this three-way valve is 2⅛x⅝x13/16 in. and has an air capacity of 10 cfm at 100-lb airline pressure.

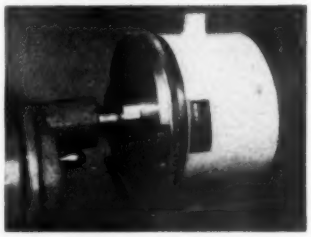
AIR-CONTROL VALVES—*Logansport Machine Co., Logansport, Ind.* Two-, 3-, and 4-way, two-position, ¼-in.-port valves are based on a single-valve body to which accessory parts may be added.

AIR VALVE—*Square D Co., 4041 N. Richards St., Milwaukee 12, Wis.* The rotary-action design of this magnet-operated air valve is said to permit high capacity and fast operation in a small size.

AIR CLAMP—*A. Schrader's Son, Div. of Scovill Manufacturing Co., Inc., Brooklyn 17, N. Y.* The Schrader air clamp is a small push-power air cylinder, incorporating spring returns. Said to provide an extremely fast and useful means of clamping work.



CLAMPS—*Lapeer Manufacturing Co., Lapeer, Mich.* Two air-operated clamps have been added to the Knu-Vise Line. The toggle bar in each is in the form of a channel which permits the spindle to be moved along its full length.

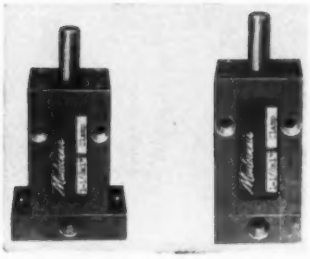


AIR CYLINDER — *Erickson Tools Div., 2311 Hamilton Ave., Cleveland 14, Ohio.* Cylinder uses the mechanical advantage of levers or dogs to give increased gripping power, and is reported to develop three or four times the force of a conventional cylinder with the same piston area.

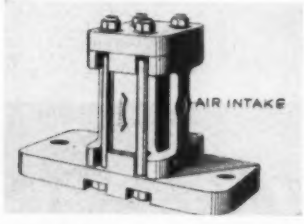
MICRO CYLINDER — *Air-Mite, 2615 W. Lake St., Chicago 12, Ill.* A threaded nose with a jam-nut lock for underneath jig installations is featured in this vertical, micro air-cylinder line.

MINIATURE AIR CYLINDER—*Air-Mite, 2651 W. Lake St., Chicago 12, Illinois.* Micro-Model cylinders are for small jigs and fixtures where size and space limitations are primary factors. They deliver a 75-lb thrust on 100-psi line pressure.

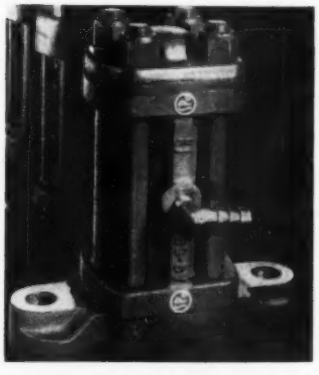
CYLINDER—*Modernair Corp., 4222 Hollis St., Oakland 8, Calif.* Double-acting return cylinder requires only half the volume of air needed ordinarily. After the initial charge of air the cylinder operates on the same volume of air as a spring-return cylinder.



AIR-CLAMP CYLINDER—*Modernair Corp., 4222 Hollis St., Oakland 8, Calif.* Square design facilitates mounting so that units may be put closer together than with conventional clamps.



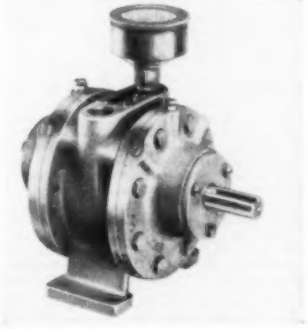
VIBRATOR—*The Cleveland Vibrator Co., 2752 Clinton Ave., Cleveland, Ohio.* Simplified design so that the number of major parts is reduced to five. Advantages: maintenance is reduced to a minimum; wear is virtually eliminated; operation is easier.



VIBRATORS—*Spo Inc., 6430 Grand Division Ave., Cleveland 5, Ohio.* Designed to deliver powerful impacts in a direction 90° to material flow. Series 81 vibrators are said to prevent the contents of bins or hoppers from arching over or plugging.

PNEUMATIC VIBRATOR — *Spo Incorporated, 6430 Grand Division Ave., Cleveland 5, Ohio.* Operating on standard 80-psi air-line pressure, Spo Series 76 vibrators deliver from 2200 to 6000 impacts per min. Speed of vibration can be regulated by varying line pressure.

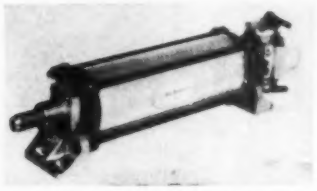
MIXING MOTOR—*The Aro Equipment Corp., Bryan, Ohio.* Portable mixing motor can be clamped on the edge of containers and adjusted to the desired angle with a swivel clamp. The Aro air motor is regulated by a needle-valve adjustment for speed control.



AIR MOTOR—*Gast Mfg. Corp., Benton Harbor, Mich.* The No. 8 air motor is claimed to offer the advantages of variable-speed drive with simple valve control, explosive-proof safety in hazardous locations, and proof against damage when stalled by overloads.

AIR-TURBINE MOTOR—*Onsrud Machine Works, Inc., Chicago, Ill.* The automatic governor of this air-turbine motor maintains a constant speed of 50,000 rpm. It is actuated by centrifugal force developed by grinder-spindle rotation.

AIR MOTOR—*The Bellows Co., 222 W. Market St., Akron, Ohio.* The Super Speed air motor is a double-acting air cylinder said to develop great piston-rod speed and power from normal operating air pressure. Utilizes a built-in air accumulator and quick-release valve.



AIR MOTOR—*The Bellows Co., Akron, O.* Air Motor Model BM2 has 1¾-in. bore and develops a thrust of twice the applied airline pressure. Speed controls for regulation of piston-rod speed in either or both directions are an integral part.

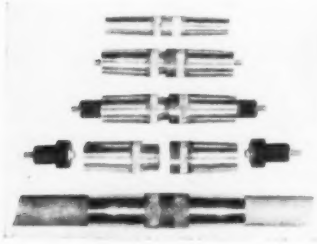
AIR-MOTOR ARBOR STAND — *The Bellows Co., Akron, Ohio.* This arbor stand makes a light-duty air press out of a standard air motor. It consists of an upright arbor in a base, which can be purchased separately or assembled.

DRY-AIR PUMP — *Aero Equipment Corp., Bryan, Ohio.* Electric-motor driven and so designed that it will deliver ½ cfm, at inlet suction of 4-in. mercury and outlet pressure of 1-in. mercury.

PAINT SPRAYER—*Gray Co., Inc., 67-11th Ave., N.E., Minneapolis 13, Minn.* Air-operated paint-supply pump and agitator delivers a full supply of paint to the spray head at fluid pressures lower than are commonly used. The unit pumps directly from original containers.

PNEUMATIC RIVETERS—*Hill Machine Co., Dept. AM, 1041 W. State St., Rockford, Ill.* Standard heads on this multiple-head riveter may be spaced to as close as 2¾-in. centers. A foot-controlled single-solenoid air valve, operating in conjunction with an adjustable timer for the riveting cycle, handles the air supply.

ALL-ALUMINUM FITTINGS—*Scovill Mfg. Co., Waterbury 91, Conn.* These aluminum fittings eliminate the galvanic action which ordinarily occurs when brass fittings are used with aluminum tubing.



CONNECTOR — *Minit-Joint Co., 115 South Lafayette Blvd., South Bend 1, Ind.* Lightweight connecting screw joint can be used for fastening rods, tubes, poles, and other stock. Made of aluminum tubing with a machined thread and knurled exterior for tightening.

FITTINGS — *Crawford Fitting Co., Cleveland, Ohio.* Called Swagelok, they provide a vacuum-tight seal. Two ferrules, and a threaded chuck inside the nut, clinch tight around tubing wall.

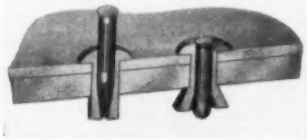
SOCKET SETSCREWS — *Bristol Co., Mill Supply Div., Waterbury 20, Conn.* Cap and setscrews in smaller sizes have been added to a line of Bristol multiple-spline socket-screw products.

SETSCREW—*Set Screw & Mfg. Co., Bartlett, Ill.* The Zip-Grip self-locking setscrew is for applications in which excessive vibration is a factor. A combination of interference fit, tension, and locking of the setscrew against the shaft provides triple-locking action.

PLASTIC-METAL SCREW — *Forman Insulating Screw Corp., 401 Broadway, New York 13, N. Y.* Called the Forman insulating screw, this fastener is said to be comparable in strength and accuracy to a standard metal screw, and to have the additional advantages of electrical insulation, shock resistance, and vibration damping.

BOLTS—*T. M. Crayton, Philadelphia 42, Pa.* Crayton T-Slot bolts are forged from Timken (SAE 4140) steel, machined to dimensions, hardened, and long drawn in an isothermic quench. Provides 50% more bearing surface on the T-Slot.

RIVET SET—*M. E. Cunningham Co., 95 E. Carson St., Pittsburgh 19, Pa.* Made from the company's Mecca Safety Steel that is claimed to prevent spalling, mushrooming and injury to personnel.



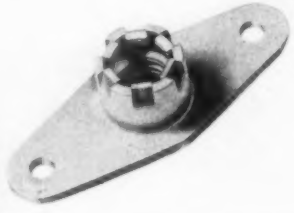
HOLLOW RIVETS—*The Cherry Rivet Co., 239 Winston St., Los Angeles, Calif.* The Drive Pin rivet consists of two parts; a hollow rivet member with a hole, tapered at the bottom, and a serrated drive pin. The rivet is locked in position by striking the pin with an ordinary hammer.

SLOTTED PIN — *Elastic Stop Nut Corp., 2330 Vauxhall Rd., Union, N. J.* A metal fastener, called the Rollpin, has been designed to replace a variety of dowel, pivot, tapered and grooved pins, which ordinarily require a key or some supplementary fastening method to hold them in place.

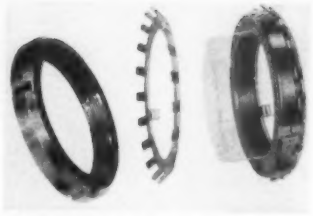
HEX KEY—*Parker-Kalon Corp., 200 Varick St., New York 14, N.Y.* The key size and corresponding socket-set and cap-screw sizes it will fit are marked on the side of the handle of these hex keys.

NUT AND LOCK WASHER—*Shakeproof, Inc., 2501 N. Keeler Ave., Chicago 39, Ill.* These units, known as Keps, are handled as one to eliminate many costly hand operations. They are easier to start because of a funneling action due to the greater ID of the washer.

STUD RETAINERS—*Security Locknut Corp., 1815 N. Long Ave., Chicago 39, Ill.* Elliptical spring-steel retainers which are forced into circular shape, creating locking pressure, can now be applied to studs, bolts, and other threaded parts.

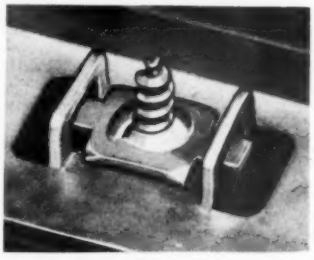


SELF-LOCKING NUT—*Boots Aircraft Nut Corp., Stamford, Conn.* Plate Lok nuts have the top locking section formed by depressing six threaded flanges inward and downward, so that they exert positive pressure against the body of the bolt.



LOCKNUTS—*Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.* Bearing positioning locknuts and lockwashers designed for effectively locking ball and roller bearings in correct position on shafts. Includes sizes for shafts from 5/16 to 7 11/16 in. diameter.

LOCKNUT—*Grip Nut Co., 310-C South Michigan Ave., Chicago, Ill.* Improved design has six triangular thread-deflection areas instead of three. The shape of the projection on the company's weld nut has also been improved to make a more positive weld.



CAGE NUT—*Prestole Corp., 1335 Miami St., Toledo 5, Ohio.* This cage nut is locked in place by dropping it under two prepunched loops that are quickly pulled up with ordinary pliers.

NUT-DRIVING MACHINE — *Detroit Power Screwdriver Co., 2803 W. 4th St., Detroit 16, Mich.* It will drive nuts on studs semi-automatically or automatically, eliminating all manual handling save to load the rotary-barrel hopper.

CAST IRON—*The Chambersburg Engineering Co., Chambersburg, Pa.* Ductile Cecolloy is a high-carbon cast iron, treated with magnesium. It is said to retain the self-lubricating and vibration-damping properties of cast iron while eliminating the inherent weakness.

TOOL STEEL — *Allegheny Ludlum Steel Corp., Pittsburgh 22, Pa.* B-47 hot-work alloy steel is a combination of chromium, tungsten, cobalt, vanadium, and iron, said to have toughness and excellent resistance to shock and abrasion at elevated temperatures.

ALLOY-STEEL CASTINGS—*Lebanon Steel Foundry, Lebanon, Pa.* Of 12% chromium content, developed for valve bodies, fittings, and similar parts required to withstand high pressures and corrosion.

LOW-CARBON—*United States Steel Corp., 429 Fourth Ave., Pittsburgh 19, Pa.* Key to the production of this corrosion-resistant steel is the reduction of carbon content to 0.03% max while maintaining the 18% chromium at 8% nickel of the usual "18-8" stainless steels.

STEEL — *United States Steel Corp., New York, N. Y.* This T1 Steel is said to remain tough even at temperatures below zero where many structural materials tend to show some loss.

PRE-SHAPED STEELS—*A. Milne & Co., 745 Washington St., New York 14, N. Y.* Made from cold-drawn bar stock, they are being made to fit specific uses. Available in a wide variety of sections and analyses.

FLAT STOCK—*Brown & Sharpe Mfg. Co., Providence 1, R. I.* Produced in 16 thicknesses and in widths up to 6 in., this flat stock is available for hardening in oil as well as water. All 18 in. long, these tool-steel strips are accurately ground to 0.001 in. thickness.

WELDED STAINLESS TUBE — *The Carpenter Steel Co., Alloy Tube Div., Union, N. J.* Has the following analysis: carbon 0.08% max; chrome 17-19%; nickel 8-10%; and selenium 0.07% min. Tests show that Stainless 303 handles in automatic screw machines at about 70% of the speed of SAE 1020.

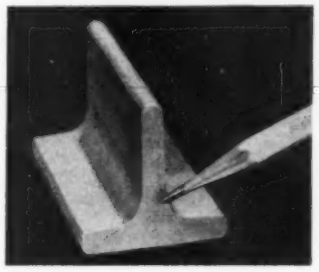
STAINLESS-STEEL TUBING — *The Carpenter Steel Co., Alloy Tube Div., Union, N. J.* A stainless steel that work-hardens much slower than conventional chrome-nickel steels is available in tubing form.

STAINLESS STEEL — *The Carpenter Steel Co., Reading, Pa.* Cold-headed bolts and recessed-head screws, cold upset and punched nuts, and parts that require severe cold coining and extrusion, can be manufactured from Carpenter's stainless No. 10.

STAINLESS - STEEL POWDERS—*The American Electro Metal Corp., 320 Yonkers Ave., Yonkers 2, N. Y.* The strength of the pressed compacts of this stainless-steel powder, prior to sintering, is claimed to have been boosted to 15 times that of other stainless-steel powders.

STAINLESS STEEL — *Armco Steel Corp., Middletown, Ohio.* Precipitation-hardening stainless steel, Armco 17-7 PH, is reported to have the strength and hardness of high-carbon spring steels and a corrosion resistance approaching that of 18-8.

STAINLESS STEEL — *Armco Steel Corp., Middletown, Ohio.* Stainless steel, called 430 ELC, reduces the cost of the special stainless required for metal-glass television tubes.



INCONEL T-SECTIONS — *International Nickel Co., 67 Wall St., New York 5, N. Y.* Hot-rolled Inconel is available in equal T-sections to manufacturers of furnaces and other high-temperature equipment.

METAL STRIP — *Alloy Metal Wire Co., Inc., Prospect Park, Pa.* A wide variety of special cross-section shapes are available in Monel, nickel, Inconel, and Almet stainless-steel strip material.

FLEXIBLE TUBING — *The Flexible Tubing Corp., Branford, Conn.* Lightweight tubing called Spiratube is available in a variety of standard plies and materials as well as special combinations.

BRASS FORGINGS—*National Cored Forgings Co., Inc., Connecticut Ave., South Norwalk, Conn.* Features: parallel walls—no draft required, long cores, coring on four sides in the same plane, and close limits in three dimensions.

BRASS COILS — *Anaconda Copper Mining Co., 25 Broadway, New York.* American Brass has developed a process for making highly finished, non-welded brass coils, heavier and having closer tolerances than previously produced.

CLAD COPPER WIRE—*Alloy Metal Wire Co., Inc., Prospect Park, Pa.* Prime use for the material is in providing a good conductor (70% that of copper) that will also withstand high temperatures without oxidizing.

BEARING-SURFACE MATERIAL—*Metallizing Engineering Co. Inc., 38-14 30th St., Long Island City, N. Y.* A self-bonding metallizing material is said to increase bearing-surface life as much as 25 times that obtained in any other way.

ROD STOCK—*Kaiser Aluminum & Chemical Sales Inc., 1924 Broadway, Oakland 12, Calif.* Redraw rod and round-drawn wires in 2S, 3S, 52S, 61S, 43S and 150S aluminum alloys. Rod is available in annealed and as-fabricated tempers. Wire is supplied in coils and standard tempers in size ranges between 0.051 and 0.0250.

TITANIUM ALLOYS — *Rem-Cru Titanium, Inc., Bridgeport, Conn.* Commercially pure titanium is available in two grades, RC-70 and RC-55, with minimum yield strengths of 70,000 psi and 55,000 psi respectively. A commercial alloy, RC-130-A, with minimum yield strength of 130,000 psi has been developed.

TITANIUM TUBING—*Superior Tube Co., Norristown, Pa.* The limited availability of Weldrawn commercially cured titanium tubing is announced by the company. Standard tempers, annealed, half hard, and hard drawn are being offered.

TUNGSTEN CARBIDE—*Adamas Carbide Corp., 1000 So. 4th St., Harrison, N. J.* Adamas Grade D, for steel cutting tools, is reported to give uniformly high and consistent performance.

ZINC ANODES—*Hanson-Van Winkle-Munning Company, Matawan, N. J.* Extruded zinc anodes, either as cylinders for ball-anode containers, or in any desired length in elliptical form, are said to bring many advantages to users.

ELECTROPLATING CARBON—*Hanson-Van Winkle-Munning Co., Matawan, N. J.* Pur-O-Carb activated carbon is said to have the consistent quality and uniformity required for electroplating.

CHROMATE FINISH — *Allied Research Products Inc., Baltimore, Md.* Iridite Alcote, a chromate corrosion-resistant finish for aluminum, is applied by non-electrolytic dip with the solution operating at room temperature.

LIQUID STAINLESS STEEL — *The Lockrey-Fater Corp., 401 Broadway, New York 13, N. Y.* The corrosion resistance and impermeability to moisture of 18-8 No. 302 stainless steel is said to be offered by this liquid. The material is applied by spraying, brushing, or dipping.

ANTI-RUST COATING—*End-O-Rust, Inc., 1900 Euclid Ave., Cleveland, Ohio.* Coating, called End-O-Rust, will air dry for handling in two to three hours, force dry in 30 min. and infra-red bake in 3 to 5 min.

RUST DISINTEGRATING—*Supersite Corp., 384 Canal Place, New York 51, N. Y.* Du-01 is said to work instantly. A fluid, it contains no acids, gasoline, kerosene, or other flammable or toxic materials.

STEEL-HARDENING COMPOUND—*Doughty Laboratories, Inc., 299 Madison Ave., New York 17, N. Y.* Hard 'N' Tuff hardening compound is claimed to impart to tool-steel drills an increase of 300% in tool life. A chromium compound, when fused into steel, it forms a hard outer surface.

PARTS and MATERIALS—Materials, Processes

DRAWING COMPOUND—*Northwest Chemical Co., 9310 Roselawn Ave., Detroit 4, Mich.* Fluid Film drawing compound is said to maintain its inherent physical properties during repeated forcible stamping of ferrous and non-ferrous alloys. It is a semi-plastic composition with high film strength.

COLD-DRAWING COMPOUND—*E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.* Houghto-Draw 357 is a heavy paste containing high-melting point waxes and fats, combined with a colloidal pigment. For use in cold drawing of hot- or cold-rolled bars or rods.

CASTING COMPOUND—*The Lockrey Co., College Point 3, N. Y.* Neither a metal nor a plastic, it displays qualities of both. Plasti-Metl is the color of copper, harder than some casting metals, but can be poured into molds at room temperature.

PLATE STIPPER—*Enthone Inc., 44 Elm St., New Haven, Conn.* A chemical for the rapid stripping of nickel, tin, lead, and chromium from copper, brass, and other copper alloys without attack upon the base metal.

OXIDIZING LIQUID — *Hanson-Van Winkle-Munning Co., Matawan, N. J.* Said to act rapidly and produce better results than ordinary chemicals such as Sulphuret, Liver of Sulphur, or their substitutes.

PICKLING INHIBITOR — *Enthone Inc., Dept. AM, 442 Elm St., New Haven, Conn.* Designated as "Enthone Inhibitor 8," it is claimed to have high inhibiting action in many types of mineral acids.

LIQUID NITROGEN—*Linde Air Products Co., 30 E. 42nd St., New York 17, N. Y.* Used to pulverize hard-to-grind materials. It is sprayed on the material to cool it rapidly to the point of maximum fragility.

FAST-QUENCHING OIL—*E. F. Houghton Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.* This oil enables a fast rate of speed through the quenching zone and assures adequate Rockwell-C hardness.

OIL ABSORBENT—*Philip Carey Mfg. Co., Cincinnati 15, Ohio.* Asbesto-Sorb is claimed to have 11 to 16% greater oil-absorption properties than comparative materials subjected to Gardner-Colman tests.

TAPE—*Minnesota Mining & Mfg. Co., St. Paul, Minn.* Scotch-brand filament tape No. 890 is made with glass and is reported to provide 500 lb of tensile strength per inch of width.

INSULATING TAPE — *Bishop Mfg. Corp., 254 W. 31st St., New York 1, N. Y.* Based on Bakelite polyethylene resins, it welds into a continuous elastic skin within a few minutes after wrapping.

PRIMER—*United Chromium, Inc., 51 East 42nd St., New York 17, N.Y.* Unichrome Primer AP-10 is said to provide excellent adhesion on magnesium and aluminum without chemical or electrochemical pre-treatment.

ENAMEL—*United Lacquer Mfg. Corp., 1001 W. Elizabeth Ave., Linden, N. J.* A fast-drying enamel, Base Y 2054, is said to provide the hardness of a baked-on synthetic with the fast drying of lacquer.

HAMMER FINISH—*United Lacquer Mfg. Corp., Linden, N. J.* To eliminate variations in hammer effect, this one-coat finish has been developed to be sprayed at the same pressure as regular enamel.

ALUMINUM PAINT — *Speco, Inc., 7308 Associate Ave., Cleveland 9, Ohio.* High heat-resistance aluminum paint is for exterior and interior metal surfaces where a temperature range of 1000 to 1500 F is encountered.

ZINC PAINT—*Zinkrich Co., Inc., 42 Broadway, New York 4, N. Y.* Tests on a paint-like compound called Zinkrich indicate that it affords the same galvanic protection to steel as hot dipping or electro-plating.

ZINC - PHOSPHATE COATING — *American Chemical Paint Co., Ambler, Pa.* Used for anchoring paint to cold-rolled steel products. Can be applied with ordinary hand applicators.

BAKELITE-BASE PAINT — *Pavinoleum, Inc., 342 Madison Ave., New York 17, N. Y.* Savinoleum is a bakelite-based product, suitable for use on machinery and industrial equipment, which dries to a tile-like finish.

METAL-CERAMIC MATERIALS — *P. R. Mallory & Co. Inc., Special Metals Div., 3029 E. Washington St., Indianapolis 6, Ind.* These mixtures are reported to have unique physical characteristics, especially at elevated temperatures. High thermal shock resistance, high strength at elevated temperatures, and good abrasion resistance are reported.

CARBON-GRAPHITE — *Pure Carbon Co., St. Marys, Pa.* Purebon No. 5 is composed of extremely fine well-bonded particles which make it highly resistant to wear and abrasion. It can be molded to size on very small bearings and is said to provide a low-cost bearing material.

COMPOSITION FOR SPRAY BOOTHS—*Oakite Products, Inc., 124 Thames St., New York 6, N. Y.* Composition No. 45 is to keep walls and working surfaces of water-washed paint spray booths clean and free of overspray.

SILICONE-RUBBER — *The Stalwart Rubber Co., 218 Northfield Rd., Bedford, Ohio.* Compound No. 161 can b fabricated more quickly and easily than previously developed silicone rubbers.

PIPE MATERIAL—*United States Plywood Corp., 55 W. 44th St., New York 18, N. Y.* Composed of glass fibers, in the form of cloth, mat, or tape, is bonded with resins to develop a tube said to be impervious to extreme heat, chemical action, and blows.

PLASTIC DIP — *Armstrong's Seal-Strip, Inc., 254 Fifth Ave., New York 1, N.Y.* A plastic dip coating, Seal-Strip, is transparent and said to be thinner and stronger than the brown ethyl-cellulose base coatings.

PLASTIC—*United States Rubber Co., 1230 Ave. of the Americas, New York 20, N. Y.* Enrup is claimed to fulfill a need for a high-strength material which is resistant to abrasion and chemicals and, at the same time, can be produced in varying degrees of flexibility.

PLASTIC PIPE — *Carter Products Corp., 10267 Meech Ave., Cleveland 5, Ohio.* Has a tensile strength of 5100 psi and a flexural strength of approximately 9600 psi. Burst pressures range with pipe diameter.

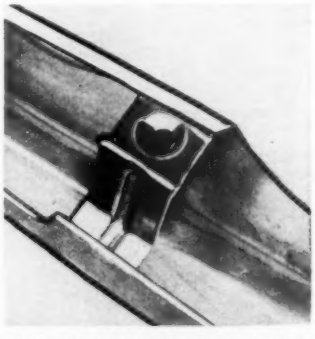
SPRAY PAINTING—*Livingstone Engineering Co., 100 Grove St., Worcester 5, Mass.* For spray painting with steam instead of compressed air, the Speedy-electric Model SP500 has been developed. It is available for use with one to ten or more spray guns.

ALUMINUM COATING—*Pyrene Mfg. Co., Metal Finishing Div., 10 Empire St., Newark, N. J.* A process, called Pylumin can give an attractive coating with definite corrosion-resistance value. In addition it provides an adhesive and efficient base for paint finishes.

ZINC DIP—*The Chemical Corp., 54 Waltham Ave., Springfield 9, Mass.* May be diluted up to 10 times without loss of brilliance or corrosion resistance. The solution is 95% inorganic materials and hence very stable.

TREATMENT FOR BRASS STRIPS —*W. S. Rockwell Co., 200 Eliot St., Fairfield, Conn.* The Rockwell cyanide degreasing installation combines a series of operations including treatment in a chemical solution, hot water and soap rinses, and uniform drying to produce clean, bright, light-gage brass strip up to 27-in. width.

CHROME PLATE—*Chrome Electro-Forming Co., 7515 Lyndon Ave., Detroit 21, Mich.* Parts, hard-chrome plated to size, require no grinding after the plating operation. Tolerances on gages are held to within 0.0001 to 0.0002 and on production parts to within 0.0005.



PUNCH-PRESS PROCESS — *Prestole Corp., 3135 Bellevue Rd., Toledo 6, Ohio.* Prestolizing is a process for making fasteners by punching cone-shaped holes in sheet metal. Formed to engage screw threads of all popular sizes, the holes can be stamped, by ordinary punch press, into any light-to-medium gage metal. Tools, dies, and license are supplied and the customer does the stamping.

Quality control checking of connecting rods on Sheffield Precisionaires at one of our leading automotive plants.

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Control charts compare measurements of present product with those of the past. Only the very best gages are good enough to have measured the past—only the very best are good enough for the present. Without truly accurate measurements then and now, quality control is but a myth.

Defects are prevented before they are made when machine operators are provided with the best indicating gages to show them "where they are going." This is just as true in Receiving and Final Inspection—and for spot check and full lot inspections.

You'll find "It's Wise and Thrifty to Specify Sheffield" gages and measuring instruments for your quality control inspection. Because of its world-wide experience, Sheffield has been accepted as headquarters for single and multiple dimension, semi and fully automatic gaging equipment. This wealth of experience is yours to draw upon—no obligation.

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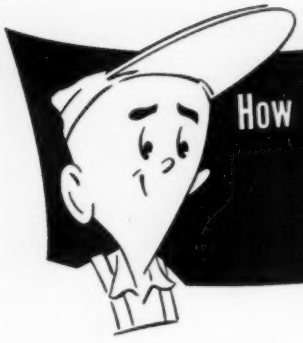
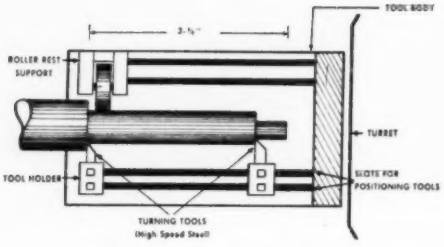
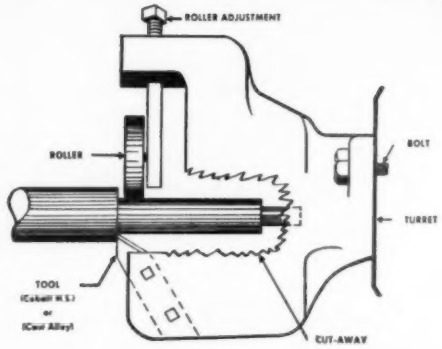


How 2 single-cutter box tools solved a problem ...by Stainless Sam



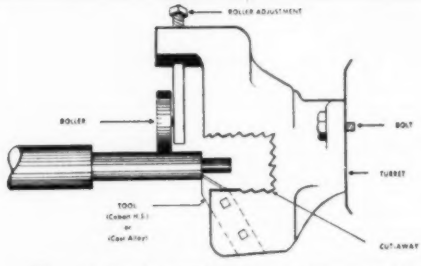
1 When Stainless Sam called on this machine shop, the operators were having a tough time with this job. They were running a ⅝"-diameter free-machining stainless steel bar on a turret lathe, using a two-cutter box type turning tool. Tool life was poor, and because of excessive overhang, surface finish was unsatisfactory.

Stainless Sam knew that by changing to two single-cutter box tools results could be improved, and machining time could be cut too.



2 He set up the first cut as shown in this sketch. The larger bit made it possible to use a 10% cobalt high speed or cast alloy tool, permitting an increase in feeds and speeds.

Since the job requires turning to only two shoulders, and one of the turned-down diameters is very short, the increase in feeds and speeds more than compensates for the time required to make the second cut.



3 Making the second cut this way decreases overhang and improves surface finish. Note that the roller-rest bears against the diameter turned in the first cut. This provides much greater assurance of accurate centering.

THIS WAS THE SCORE:

4

OLD METHOD—	
Speed: 70 SFM; Feed: .0075" per rev.	
Total machine time	68 seconds
NEW METHOD—	
Speed: 140 SFM; Feed: .010" per rev.	
First Cut	25 seconds
Indexing of Turret	5 seconds
Second Cut	7 seconds
Total machine time	37 seconds
MACHINE TIME SAVED	31 seconds

Oh yes, the problem of tool life and surface finish was solved too.

Get complete information on turning and other machining operations. Write for a copy of the Armco booklet, "Machining of Armco Stainless Steels."

If you are not using Armco Stainless Steels, perhaps parts of your equipment or products for defense could benefit by these rustless metals—often at no increase in cost. Armco Stainless resists heat and corrosion, adds strength and beauty to the products you make.

50th ANNIVERSARY SPECIAL PURPOSE STEELS

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REFERENCE BOOK SHEET

Microstructures of Metals—I

By Dr. MICHAEL FIELD
NORMAN ZLATIN
Dr. JOHN F. KAHLES
METCUT RESEARCH ASSOCIATES

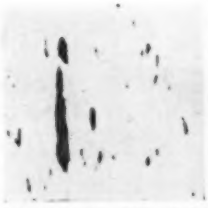
MACHINABILITY of metals has been definitely related to microstructures (See Special Reports in *AM*, Nov. 27 and Dec. 25, 1950). This being the case, the shop man will find increasing need for a knowledge of microstructures and reference illustrations of the various microstructures possible for a given iron or steel. These variations in structure are brought about by prior processing of the material, including heat treatments, before the machining stage is reached. Through ability to recognize structures as seen in photomicrographs supplied by the plant laboratory, the steel mill or the vendor foundry or forge shop, the tool engineer can choose the optimum feed-speed combination. He may decide that the material does not possess the best structure for economical machining, and may call for additional heat treatments if product-engineering considerations permit.

The above Special Reports provided considerable data on microstructures. However, a more extensive treatment of the subject was prepared by the authors for the "United States Air Force Machinability Report—1950" published by Curtiss-Wright Corp. They covered irons, steels and high-temperature alloys. In view of the potential importance of the subject to production men, the Metcut report will be published in full in Reference Book Sheets in this and a succeeding number.

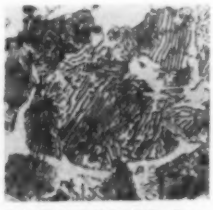
Structure of a metal can be determined by polishing a small metal specimen to a high finish on metallurgical polishing papers and cloths charged with fine abrasives. When viewed under the microscope, the polished specimen appears to be highly reflective except for small areas containing non-metallic inclusions such as sand, slag, or manganese sulfide.

The actual microconstituents of the metal can be brought out by etching the polished specimen surface with dilute acid. A common etchant for steels and cast irons consists of a 5% nitric acid-95% alcohol solution, which is called "nital." When the specimen is immersed in nital for a few seconds, the acid attacks the metal constituents selectively. Certain constituents are etched more than others, causing them to be darker. The actual structure is thus brought out by various etchants. Ordinarily, to resolve or "see" the microconstituents, it is necessary to use microscope magnifications of 100 to 1000 times.

Effect of Etching Polished Metal With Acid



Unetched SAE 1112. Dark stringers are non-metallic inclusions of manganese sulfide. 200 X

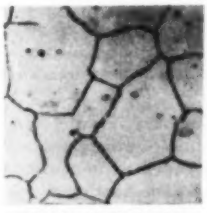


Nital-etched SAE 8640. Constituents of the microstructure are revealed by selective attack. 1000 X

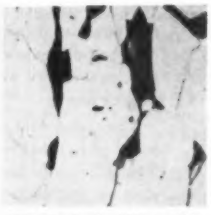
MICROCONSTITUENTS

Steels and cast irons have many common microconstituents, such as ferrite, pearlite, free carbide and martensite. Cast-iron structure differs from steel in that cast iron contains free graphite while steel does not. Cast irons also contain considerable amounts of an iron-phosphorus-carbon constituent known as steadite. Steels and cast irons also contain manganese-sulfide inclu-

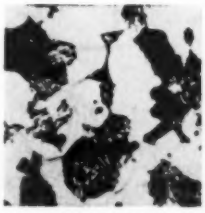
Ferrite and Pearlite in Irons and Steels



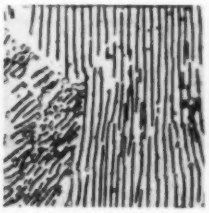
100% free ferrite in Armco iron. Nital etch. 1000 X



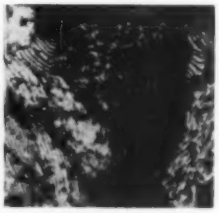
85% free ferrite, 15% pearlite in SAE 1010. 500 X



50% ferrite, 50% pearlite in slowly cooled SAE 1040. 500 X



Coarse pearlite is obtained by slow cooling SAE 1080. 1000 X

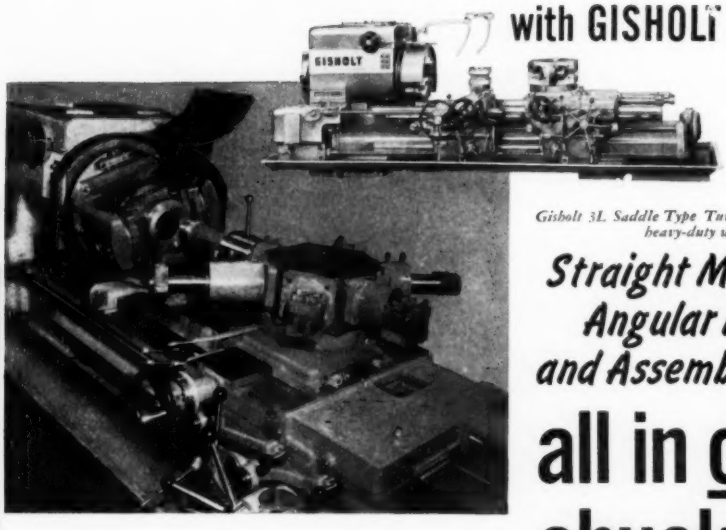


Fine pearlite is produced by rapid cooling of SAE 1080. 1000 X

Nice work if you can do it...

and you can...

with GISHOLT Turret Lathes...



Gisholt 3L Saddle Type Turret Lathe—one of five sizes for heavy-duty work of all kinds

Straight Machining... Angular Machining and Assembly...

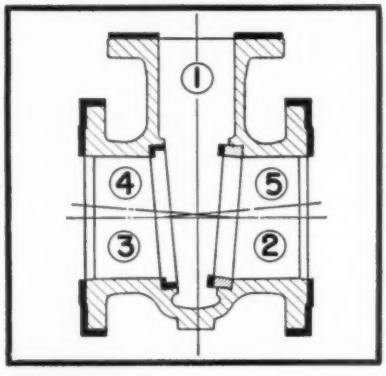
all in one chucking!

Talk about time-cutting ideas, here's the versatility of a Gisholt 3L Saddle Type Turret Lathe paying off again.

All operations required to machine these gate valve bodies are done in a single chucking with a five-position indexing fixture. In addition to machining the bonnet and the two ends, the recesses for the two seat rings are bored and threaded at a five degree angle.

Then the seat rings are inserted—and tightly screwed in place with a driver mounted on the turret. The driving is done with a constant torque—adjustable to suit each job. The final operation is finish facing the seat ring after it is in place with the cross-feeding turret.

Gisholt Engineers have storehouses of ideas to help you increase your production. Ask one to call.



GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*

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Microstructures of Metals—II

sions. These occur as traces, except in free machining or resulfurized steels.

High-temperature alloys have a structure consisting of a solid-solution matrix and free carbide segregations. The austenitic stainless steels have a similar structure. Incidentally, by *matrix* structure is meant the structure of the major constituent present in the alloy.

Ferrite—Ferrite is practically carbon-free iron, but may contain nickel, manganese, silicon and other elements in solution. When etched with nital, the ferrite grain boundaries are darkened, leaving the actual ferrite as a white background. From the grain boundaries, therefore, it is possible to determine whether the ferrite grains are large or small.

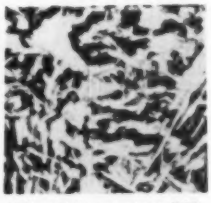
Ferrite is present in the free form in most low-carbon steels. In the medium-carbon steels (carbon content 0.35 to 0.50%) free ferrite is likewise present if the steel is slowly cooled. Thus, Armco iron is composed of 100% ferrite. SAE 1010 steel contains about 85% free ferrite, the remainder being pearlite. SAE 1040 steel, slowly cooled, contains about 50% free ferrite and 50% pearlite.

Pearlite—The second major constituent of steels and cast irons, pearlite, consists of alternate layers of ferrite and iron carbide. When etched with nital, these constituents appear as alternate black and white stripes which have the appearance of mother-of-pearl, hence the name "pearlite."

The pearlite grains may be large or small and the lamellar (platelike) spacing may be wide or narrow. Usually, large grains go with wide lamellar spacing, and both are produced by relatively slow cooling. Pearlite is present in small quantities in the low-carbon steels, and the quantity present increases with carbon content. Thus, SAE 1010 contains about 15% pearlite, SAE 1040, slowly cooled, contains about 50% pearlite, while SAE 1080, slowly cooled, contains 100% pearlite. The remaining constituent in the SAE 1010 and 1040 steel is ferrite. In medium-carbon alloy steels such as 8640, it is possible to obtain almost 100% pearlite by the proper cooling rate from the austenitic temperature range, but the lamellar spacing is extremely fine.

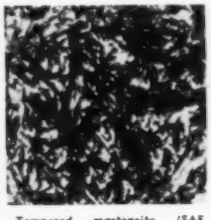
Additional Structures Produced by Heat Treatments

Spheroidized SAE 8640. Ferrite provides the background for the spheriods of carbide. 1000 X



Widmanstatten structure (SAE 1040) occurs when steel is cooled from high austenitizing temperature. 250 X

Needle-like, or acicular, martensite is produced by rapid quenching SAE 1080 from austenitic range. 1000 X



Tempered martensite (SAE 8640) is characteristic of quenched and tempered steels. 1000 X

Bainite, if acicular, resembles martensite, but also occurs with a feathery appearance. SAE 1080. 1000 X

Spheroidized Structure—In annealed steels the combined carbon is generally in the form of iron carbide as a constituent of pearlite. The platelike form of the carbide may be altered to spherical shape by a variety of heat treatments. Spheroidized steels generally provide longer tool life when machined with high-speed steel tools.

Widmanstatten Structure—A crosshatch pattern of ferrite and pearlite is known as widmanstatten structure. This pattern is caused by the ferrite having been selectively cooled along certain crystallographic planes instead of at grain boundaries. The widmanstatten structure results when steels are cooled at a critical rate from very high austenitic temperatures, such as those encountered in forging and rolling practice.

Martensite—Martensite is a hard, brittle constituent formed when steel is quenched or cooled very rapidly from the austenitic temperature. It has a characteristic needlelike or "acicular" appearance under the microscope.

Steels in a quenched, martensitic condition are rarely used in engineering applications. Ordinarily, such steels are tempered back to 250 to 400 Brinell to improve the physical properties. Tool steels are tempered to 60-65 Rockwell C. Tempered martensite has an appearance similar to quenched martensite under the microscope when the tempering temperature is low. When the tempering temperature is increased, some of the acicular quality is lost.

Bainite—Another constituent encountered in steels is bainite. This is often described as a feathery combination of ferrite and carbide and occurs in steels that are treated isothermally in a given temperature range (480-1100 F.), and in small quantities in ordinary quenched steels. In the upper temperature range the appearance is different from but something like pearlite, while in the lower range it is acicular, more like martensite.

Free Carbides—Free carbides oc-

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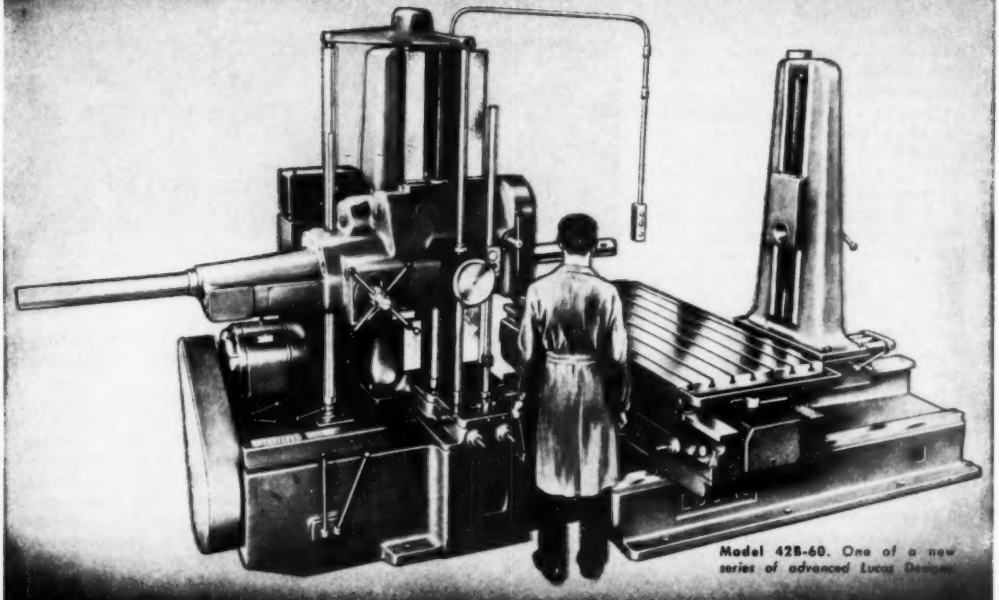

Model 42B-60. One of a new series of advanced Lucas Designs

Both a tool room and a rugged production machine. It can be *automatically power positioned* without the use of jigs and fixtures. Positively repeats a series of operations on any required number of large or small pieces.

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American Machinist REFERENCE BOOK SHEET

Microstructures of Metals—III

cur in steel, usually as minor constituents. The carbides appear as white areas with definite grain boundaries. In ordinary steels, the presence of free carbides indicates lack of control. However, in the high-carbon and tool steels, free carbides are usually present. In such steels it is essential that the carbides be uniformly distributed.

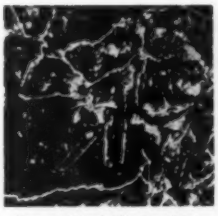
Austenite—Austenite is a solid solution of carbon in iron and exists in carbon steels at temperatures usually above 1300 F. Under the microscope austenite looks like ferrite in that one sees white austenite grains outlined by dark grain boundaries.

Austenite is a structure present in steel when it is brought up to the proper temperature for rolling and forging, and also at the temperature that the steel is brought to prior to quenching for hardening. In common alloy steels, austenite is unstable at room temperature and hence does not exist at room temperature except in small amounts. Partial austenite is present in the highly alloyed tool steels at room temperatures. Complete austenitic steels are possible in the iron alloys containing large additions of chromium, nickel or manganese, that is, the 18 chrome, 8 nickel stainless steel, or the 12% manganese "Hadfield" steel.

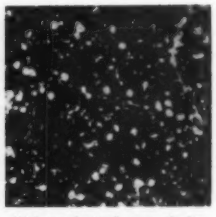
Solid-Solution Matrix—Solid-solution matrix, typical of that found in high-temperature alloys, has the appearance under the microscope of austenite. Actually, the matrix consists of face-centered constituents. The austenite-like appearance leads many people to call this structure austenite.

Manganese Sulfide — Manganese sulfide is a slate-gray appearing, non-metallic inclusion found in steels and cast irons. It results from the combination of manganese with the sulfur in the steel and is usually present as traces. Manganese sulfide is a constituent which apparently tends to smear over the tool face and reduce friction between the chip and tool. Machining properties are improved if there is a sufficient quantity of manganese sulfide present in the alloy.

Free Carbides Adversely Affect Tool Life



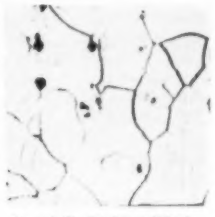
Free carbides (white areas) surround grains of pearlite in SAE 10120. Nital etch. 500 X



High-speed steel may depict free carbide particles in a background of tempered martensite. 1000 X

High-Temperature Alloys Will Show a Solid-Solution Matrix

Austenite grains in AISI 347 stainless steel (18 chrome, 8 nickel). Ferric-chloride etch. 1000 X



Inconel X also has solid-solution matrix, as brought out by a nitric-hydrofluoric acid etch. 500 X

Manganese sulfide is most readily detected in steels by observing the specimen in the unetched condition. The constituent appears as a gray inclusion in the white background. For this purpose, it is desirable to cut the specimen so that a longitudinal section is observed. As rolling practice tends to elongate the sulfide inclusions, the inclusions appear as elongated stringers.

Free Graphite—Cast irons contain free graphite in addition to most of the constituents described above. In common gray irons, free graphite is present in flaky form. The flakes may be large or small, depending upon the cooling rate. Large flakes are associated with slow cooling. Nodular graphite is present in malleable iron, and spherical graphite in the recently developed ductile cast irons.

The characteristic appearance of the graphite in cast irons can be brought out by observing the specimen in the polished, unetched condition under the microscope. The free graphite flakes or nodules appear gray or black on the white, highly polished background.

Steadite—Steadite commonly occurs in cast irons having phosphorous content of over 0.1%. The microconstituent appears as white areas with black specks in them. Steadite is an iron-carbon-phosphorous eutectic composition with the lowest melting point of any constituent present in cast iron. Since it is the last constituent to solidify, it forms at the grain boundaries and hence has a typical angular appearance.

Free Carbide—Free carbide can be present in cast iron in larger particle size than that found in steel. When etched with nital, free carbide has a white background with a definite grain boundary which separates the carbide from other constituents. At times it is difficult to distinguish ferrite from free carbide in cast irons. Usually the free ferrite in cast irons blends in with the free ferrite in the pearlite, while the free carbide has definite grain boundaries, separating the carbide from the pearlite. In doubtful cases, it is necessary to use etchants which selectively attack ferrite with respect to carbide, and hence darken one more than the other.

(To be continued)

To help you get the most out of the steels you're getting

The rearmament program, even at this early stage, is packed with headaches for steel users. And that is true whether you are working on defense orders or on non-military requirements.

If **you are operating under DO priority ratings you will of course get first call on critical steels. The steels you need for government defense orders will somehow be made available, but—you will still be faced with the necessity of quickly making the most out of those steels. For military needs are pressing and promise to become more so.**

If **you are working on purely civilian goods, your problem is an even more difficult one. You will find it almost impossible to obtain certain steel items that are essential for defense. To fill the gap you will have to employ substitute steels. You'll need help not only in selecting the proper substitute steels, but in using them properly.**

We are prepared to assist you in either situation.

The steel engineers and metallurgists we have assigned to this important job of helping you use steel more *effectively* are the same men who were largely responsible for the development of National Emergency steels—one of the outstanding metallurgical accomplishments of World War II. These men can call upon the facilities of the most completely equipped steel research laboratories and the largest steel making plants in America. They can bring to the solution of your problems the very latest ideas and time-saving techniques in the working and treatment of steel. We urge you to draw freely upon this rich reservoir of experience.

UNITED STATES STEEL COMPANY, PITTSBURGH
COLUMBIA STEEL COMPANY, SAN FRANCISCO · TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
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UNITED STATES STEEL

TALKING SHOP

Team Seniority

CLAUSE in a recently signed labor agreement in the Mid-West: "The company shall have the right, without regard to their seniority rating, to retain or to call back to work after layoff, a limited number of employees who are clearly of unusual or special ability or talent exceeding that of men of greater seniority, including members of the basketball team."

Optics in Stress Study

THE INTERFERENCE PATTERN between an optical flat and a polished steel specimen is being used in a series of studies to determine the distortion caused by grinding. Dr. Harold R. Letner of the Mellon Institute has been working for the past five years under the L. Leslie Byers Memorial Fellowship, established by the Grinding Wheel Institute, to determine just how important residual grinding stresses are. It is known that in some cases, service life of metallic parts ground with abrasives may be increased or decreased by grinding, and it is suspected that the cause may be the stresses remaining in the surface after grinding. The occurrence of grinding cracks, for example, is frequently attributed to tensile stresses in the surface, so an understanding of how these stresses arise and how grinding affects them is an important step in improving the service life of ground parts. Dr. Letner is studying the problem by determining the topography of the polished surface of a flat steel specimen, before and after the opposite side is ground by an abrasive wheel.

High-Angle Milling

JONES & LAMSON is broadening its application of high-angle milling (*AM*, April 3, 1950, p122). One additional point learned, according to Walden Sinawski, author of the original article, is that hot-rolled stock causes rapid cutter wear because of the abrasiveness of the oxide on it.

Dust Baffler

FOR YEARS, dust settling on the fine finish of auto-body tops has frequently forced reworking after final inspection. De Soto, in its new Detroit body plant, has designed the conveyors so bodies can be turned upside down when they go through the drying ovens. Thus dust can't settle on the finish while it's tacky.

Overstiff Spring

NEW BODIES in the Chrysler line have spring-counterbalanced trunk lids. These are assembled with springs in place before painting and oven-baking. The oven temperature proved high enough to draw spring temper, so springs were too soft at final inspection. Now springs have extra strength, so they come out of the ovens with proper stiffness. To hold them down during painting, an outside chain is clipped from lid edge to body cart.

Copper Cut

ONE AUTO MANUFACTURER has cut the weight of the radiator core (almost pure copper) from 46 lb to 24 lb by reducing thickness of the cooling fins and tubes. Fins have been cut from 0.005 or 0.006 in. to 0.003 in. thick, walls to 0.005 in. except where structural strength is required; there 0.009 in. is still standard. Two tube thicknesses make assembly and selection more difficult but help conserve copper.

Rain Blasting

RAIN spells trouble for a jet plane. At speeds of 400 mph and above, rain can scour away the pin-up picture on a fuselage in one trip. What's worse, rain will cut through the pure aluminum cladding on leading edges and through the laminated-plastic covers on radomes (housings for radar) in 24 hr of flight. Best solution to date seems to be a 0.010- to 0.012-in. coating of neoprene. It's easily painted on by ground crews, can be rebuilt if worn off, has stood up for 10 hr. at 400 mph in rain.

Memories

J. R. LOFFELMACHER, proprietor of the machine shop in Fairfax, Minn., sends us a dollar for the 1951 Production Preview with the note that he has the issues for years back and a postcard depicting an 1882 *Minnesota Giant*, a 12-hp reaper that burned straw and wood and had a chain drive. Owned by his father, it ran for years.

Daffynitions

JURY: something that won't work right after it's fixed . . . BETROTHAL: ringing a belle . . . TRUMAN AND MACARTHUR: gentlemen who talked Formosa the day . . . COMMUNIST: guy who borrows your pot to cook your goose in . . . HYPOCRITE: undertaker looking sad at $5000 funeral . . . HILLBILLY QUARTETTE: eight nostrils with sound . . . COUNTER INTELLIGENCE: sharp shopper . . . HINDSIGHT: rear view of a mistake . . . SARONG: dish towel that made good . . . HORSE SENSE: what should be mixed with horsepower . . . GOSSIP: letting the chat out of the bag . . . IODINE: covers a variety of shins . . . ELECTRICIAN: man who wires for money . . . CRISIS: baldness coming to a head . . . DIAPER: a top for a bottom.

Paper Rule

A NAVY RULE OF THUMB during World War II, according to one retired officer, was to weigh each day the papers pertaining to a battleship. When the total weight was equal to the deadweight tonnage of the ship, the latter was launched.

News of Metalworking

McGraw-Hill WORLD NEWS

OERLIKON TO OPEN HERE — Maschinenfabrik Oerlikon, leading Swiss machinery manufacturer, will establish a branch factory at Tacoma, Wash. The new plant, to be operated under the name of Pacific Oerlikon & Co., will make, in particular, high-tension switches. Production will start in the spring of 1951.

TYPEWRITERS IN ITALY—Remington Rand, Inc., Buffalo, N. Y., is reported to have applied for permission to open in Naples a factory for making typewriters, to employ some 2000 workers. Remington would import parts from U.S. for first two years until the factory became able to turn them out. Typewriter exports from the Italian factory are planned at an annual value of $1 million.

NEW TRAM-CAR—A new 4-axle tram-car has been developed at Duesseldorf, Germany, by the tram-car, wagon and electrical industries of North Rhine-Westphalia. Used with trailer, the tram-car has seating for 200 persons, with speed of 24 kmph. Running and maintenance costs are said to be much lower than those of present types of tram-cars.

BICYCLES FOR BRAZIL — Horiveult interests of Holland will establish a bicycle factory at Rio de Janeiro. Some $200,000 worth of special equipment to fit out the plant is being imported, plus $150,000 in initial stock of parts. Later, Brazilian-made components will be used where possible.

SOIL-SHIFTERS FOR U.K. — A plant for manufacture of specialized soil-shifting equipment will be established in Lanarkshire, Scotland, by Euclid Road Machinery Co., Euclid, Ohio. A British-owned subsidiary, Euclid, Ltd., will be set up. As a start the firm will make a rear-dump vehicle based on the American Euclid model, powered by a 150-hp diesel engine. Plant output of 150 to 200 vehicles annually is anticipated. About 75% of the output will be exported.

New General Wage Policy Will Let Pay Rise With Cost of Living

WASHINGTON — A general wage policy will be announced by March 1. It will be applied by a national wage administrator under the Wage Stabilization Board. You can figure on a "soft" policy at the beginning at least, letting wages rise with the cost of living.

There's some talk of using a streamlined "emergency" price index as the wage escalator regulator instead of the standard BLS index. It would include only basic essential living cost factors like food, rent, clothing. Then the government would subsidize food and clothing, control rents, thus hold the index in line and keep the escalators from raising wages further. Big hitch: it will require union agreement.

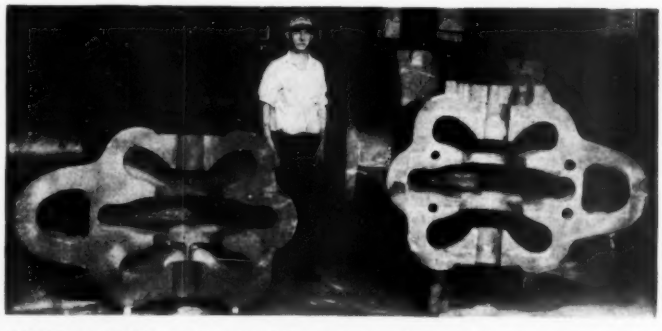
• **After a wage policy is set,** you'll hear more talk about how to handle disputes. The administration favors another War Labor Board to handle both disputes and wage controls. Management spokesmen will argue for separate boards, but won't win. WSB chairman Cyrus Ching wants to go back to his conciliation post and give the Federal Conciliation Service a bigger role in handling disputes than it had in the last war.

No serious thought is being given yet to ordering a longer workweek on defense work. Idea is to let the workweek lengthen naturally by voluntary management decisions. This is happening in many metalworking areas. Some metalworking plants in Baltimore, Syracuse, Lancaster, York and Wichita have increased hours to 50 or more a week. Aircraft, particularly in Los Angeles, has lengthened the week in various departments to compensate for shortage of special skills. Plants in Cleveland, Atlanta, Youngstown and Boston have added extra shifts, but tight labor supply prevents this in many areas. Six-day week is common in Cleveland, Wichita and Scranton.

Yet some plants in Norfolk-Portsmouth, Va., area have cut shifts because of material shortages. Some third shifts were dropped in Milwaukee because of labor shortage.

• **Acute shortage of skilled** craftsmen did not ease between September and end of November, and in fact has worsened, USES found. The growing shortage of skilled and semi-skilled has not impeded defense and civilian production seriously, USES found, but has resulted in modification of expansion plans.

USES found these skills still generally short at end of November: machinists, tool and die makers, turret and engine lathe operators, welders, molders, coremakers, riggers, pattern and model makers, blacksmiths and millwrights.

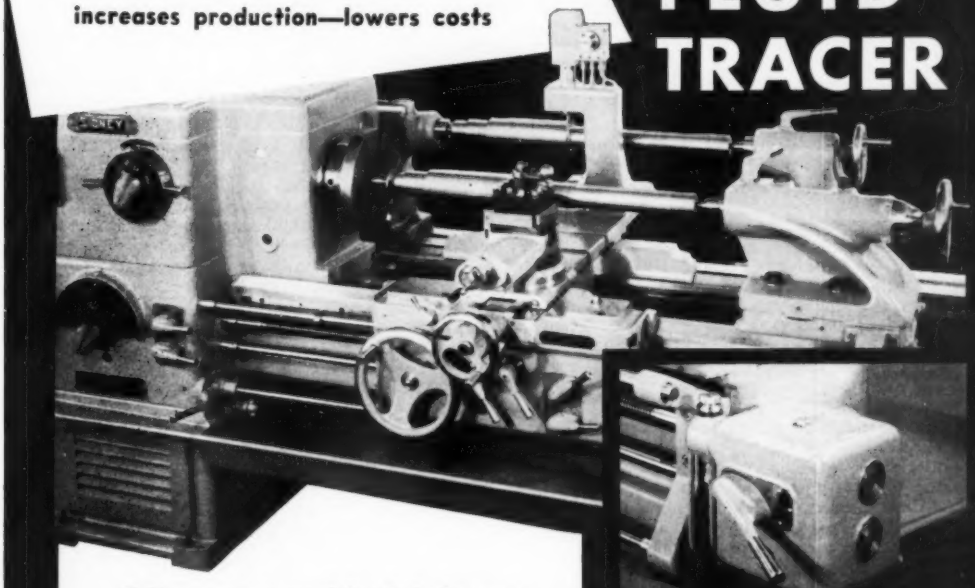


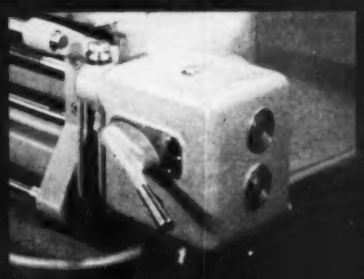
NODULAR IRON was substituted for steel in this pump case cast at Farrel-Birmingham foundry, Derby, Conn., with appreciable cost savings reported. Crux of the casting process is introduction of small amount of magnesium which converts the graphite to spheroidal form. DeLaval Steam Turbine Co., Trenton, N.J., reports satisfactory hydrostatic tests in using nodular iron for pump casings of this type, with slight deflection at 750 psi, and no leakage at 1500 psi

SIDNEY LATHES' NEW FEATURE

increases production—lowers costs

. . . the SIDNEY FLUID TRACER





Sidney hydraulically controlled clutch and brake regulates oil flow and synchronizes longitudinal feed with cross slide travel . . . also bypasses oil flow in regular lathe work.

● Now, count on your Sidney Lathe for greater than ever versatility . . . a wider range of work, more production at lower cost.

THE NEW SIDNEY FLUID TRACER attached to any Sidney Model 32 Lathe will reproduce your work from either flat or round template . . . an all-hydraulic control, it serves the dual purpose of tracing and regular lathe work without limiting the range of either . . . increases the value of your lathe investment . . . eliminates the necessity of extra expense for a single purpose tool.

Position only one lever on the clutch and brake unit to engage or disengage the tracer unit . . . as simple as that. No loss of valuable time . . . no extra units to store . . . no parts to put on or take off when changing over from tracing to standard lathe operation.

The Sidney Fluid Tracer gives you the same precision work accuracy for which all Sidney products are famous. Any change in the contour of the master piece is instantly transmitted through the ultra-sensitive tracer valve . . . even sharp shoulders are faced to extremely close limits.

Combine the Sidney Fluid Tracer with any Sidney Model 32 Lathe and you have, without question, the finest turning tool ever produced.

Write for detailed literature, or see your nearest Sidney representative

Here are samples of reproduction work performed by the Sidney Fluid Tracer . . . accurate, faithful tracing of any contours in the master piece.

SIDNEY MACHINE TOOL COMPANY • SIDNEY, OHIO

Builders of Precision Machinery Since 1904

Name Sought for New Radial Drill Column Clamp

CINCINNATI—A first prize of $500 in cash will be awarded to the person suggesting the best name for a new column clamp for Carlton radial drills, the Carlton Machine Tool Co. has announced. A description of the new clamp is given in the January 8, 1951, issue of AMERICAN MACHINIST, page 146.

Honorable mention merchandise prizes, totaling $500, will be given to contestants who submit names which the judges consider especially worthy. The Carlton distributor salesman serving the grand prize winner will receive a $100 cash bonus. If two or more contestants submit the identical winning name, the grand prize will be divided equally among them. The same rule applies to the cash bonus for distributor salesmen.

A contestant must fill in an official entry blank which may be obtained from Contest Committee, Carlton Machine Tool Co., Cincinnati 25, Ohio. Each contestant is limited to one name and one entry only. Entries must be postmarked by midnight March 31, 1951.

Judges in this contest are: Wendell E. Whipp, chairman of the board Monarch Machine Tool Co.; Charles W. Simpson, vice president and general manager National Acme Co.; and Burnham Finney, editor, AMERICAN MACHINIST.

German Heavy Machine Tool Builders Recover from Total Dismantlement

BY JOHN J. CHRISTIE
McGraw-Hill World News

DUESSELDORF — Fortunately for western European rearmament, three of Germany's renowned producers of heavy machine tools are recuperating from total dismantlement.

Back in business, after being dismantled down to the last bolt, are: Schiess (formerly Schiess-Defries) of Duesseldorf, Wagner of Dortmund and Waldrich of Siegen and Coburg. A fourth in this category, Froriep of Rheydt, escaped the reparations list but suffered heavy war damage.

Ironically these plants were among the very first victims of the since watered-down dismantling program because heavy machine tools were considered a particularly essential factor in war production.

Schiess, whose five plants in the Duesseldorf area were divided among Russia, Albania, Yugoslavia and France, has made a notable comeback. Production of machine tools has reached 50% of pre-war.

• **Rehabilitation** has had to be self-financed except for an ERP counterpart fund loan in connection with establishing textile machinery production. Regulations forbid use of ERP counterpart funds to finance re-equipment of dismantled facilities.

Within a matter of weeks, construction will be completed on a modern new hall which will enable Schiess to expand machine tool production to about 75% of pre-war. Here is the present outlook for production and delivery of principal Schiess machine tools:

Smaller vertical boring mills up to 2½ meter turning diameter can be delivered in six months, those up to 3½ and 4 meters in a year, and those up to 12 meters in 18 months.

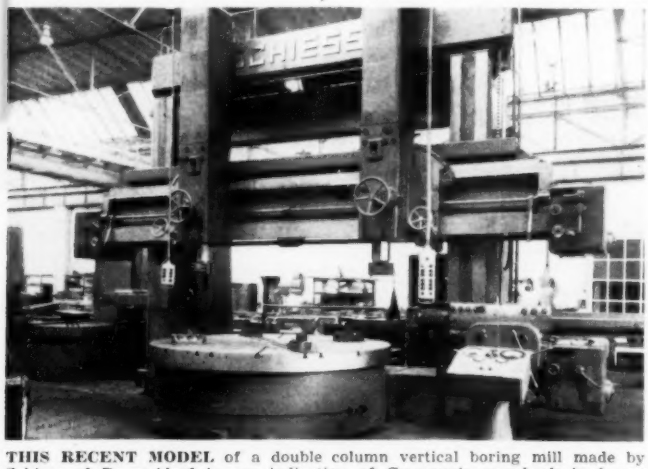
The firm has considerable unused capacity for making Fay semi-automatic turning lathes, which it originally built under a Jones & Lamson license that expired in 1939. The firm can produce 10 to 15 of these lathes per month. Three sizes are available, i.e. turning diameters of 180 mm, 280 mm and 420 mm.

Schiess was an exclusive world producer of heavy vertical boring mills up to 24 meters. It will be in a position to build these larger sizes within a few months. The plant also soon will be able to resume production of crankshaft turning machines of 3 meter turning ring.

Waldrich and Wagner are not yet rehabilitated to the same extent but their production will be equally in urgent demand. Waldrich's production includes rolling mill lathes and grinding machines, square ingot turning lathes, large size mechanical planers and smaller hydraulic ones. Wagner is a noted producer of large planers and lathes and sheet machinery. Froriep, now about 75% or more restored from war damage, is a leading producer of horizontal and vertical boring mills.

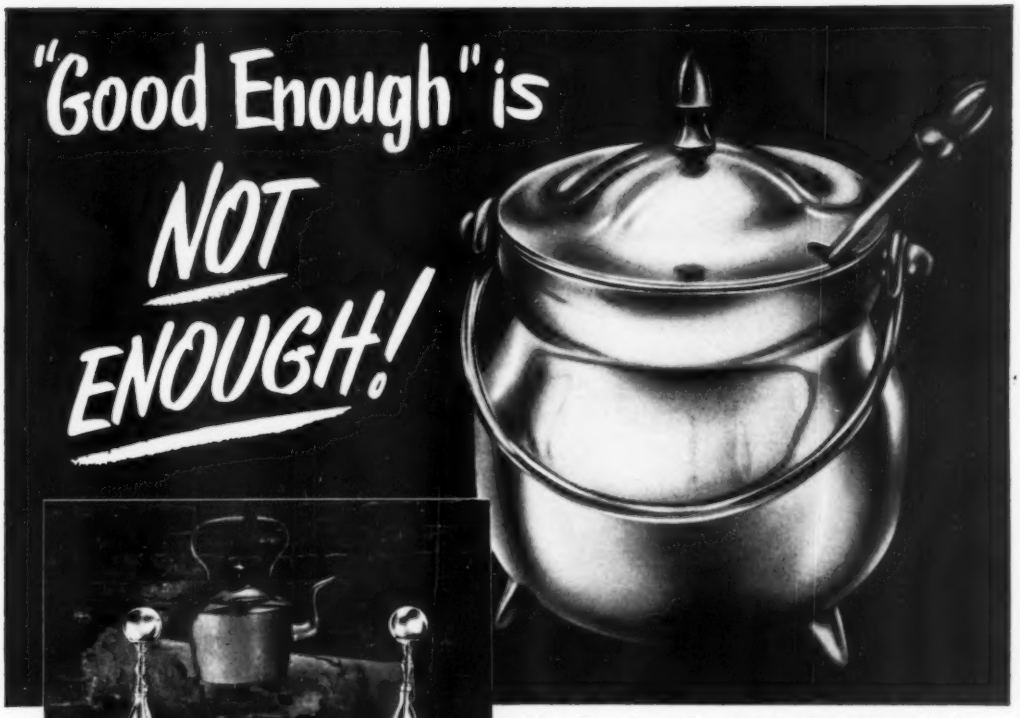
• **Production of the regular line** of machine tools in Western Germany continues to boom under an avalanche of defense-inspired orders from neighboring countries to the west. Exports will be more than double this year as a result of this boom which became marked just after the Korean conflict began.

Most firms are working at manpower capacity but not at plant capacity. Shortage of skilled manpower in the metalworking industries is due primarily to inability to bring job and worker together because of inadequate housing.



THIS RECENT MODEL of a double column vertical boring mill made by Schiess of Duesseldorf is one indication of Germany's comeback in heavy machine tool field. Machine has 4-meter turning dial, with push-button control and electric mechanical clamping of the traverse. Sales have been made during past year to France, Britain, Scandinavian countries and South Africa

"Good Enough" is NOT ENOUGH!



Revere Brass of carefully controlled grain sizes is used in the Andirons, the Fire Lighter, the Lighter Cover and the Torch Handle.

● Sometimes a routine laboratory procedure finds ways to make improvements even when everything already is "completely satisfactory". In fact, that is one of the main reasons for carrying out laboratory routines.

A case in point is the Decorative Polished Brass Fire Lighter produced by Peerless Manufacturing Corp., Louisville, Kentucky.

Here is a product that was rolling down the production line and on into homes all over the country. The consumers were satisfied and Peerless was pleased with the appearance of its product. There were no troubles. Nevertheless, the Revere Technical Advisory Service was asked to study the polishing methods and find out if even better procedures would be advantageous.

Just as a routine procedure our laboratory men cut up several of the partly drawn "Pots" and checked on the gauge diminution caused by drawing. The "Lab. Men" are continually doing things like that . . . studying the successful products in order to pile up data which may be useful when they run into a "problem" product.

They found that with a different drawing sequence the draws, although still deep, could be made less severe. The new drawing sequence would permit the use of smaller grained metal. The smaller grain would make polishing easier, even though the product as it went out into the market could have *no* more than the same highly polished beauty it always had.

By testing to find if it could get one cost saving, this company got two.

Perhaps you also are thinking in terms of one slight improvement when two or more are readily available. The Revere Technical Advisory Service offers the laboratory routines which will find out. If you use copper, brass, bronze, aluminum, nickel silver—any alloy which Revere can make—just get in touch with the nearest Revere sales office.

REVERE

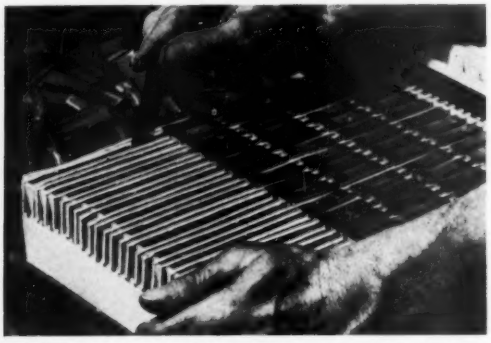
COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, New York

• • •

Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.
Sales Offices in Principal Cities, Distributors Everywhere.



COPPER-ALLOY INFILTRATION is achieved by stacking blades, root end up, with a small block of copper alloy on each blade root (above). In hydrogen furnace at 1900 F, melting copper is absorbed by the still-porous blade, raising density close to 100%

SPECIAL SECTIONAL DIES and a 250-ton press shape iron powder into blades (left). Dies get uniform compression by putting heavier pressure on thicker part of blade. Following first step, blades have 65% uniform density. Steps (2) and (3) raise this to about 80%

Sales Representatives Named

• **Westcott Chuck Co.,** Oneida, N. Y., has appointed John T. Everett & Co., Memphis, Tenn., district representative in Alabama, Arkansas, Oklahoma, Mississippi, Tennessee, and Texas.

• **Sier-Bath Gear & Pump Co.,** North Bergen, N. J., has named the following companies representatives for Sier-Bath gear couplings: J. R. Ruddock & Associates, Chicago, covering northeastern Illinois, including Chicago area; Volco Co., Minneapolis, for Minnesota, Iowa, South Dakota, North Dakota, northwestern Illinois and Michigan peninsula; W. B. Conrad Co., Detroit, for southeastern Michigan.

• **Cleveland Tramrail Div.,** Cleveland Crane & Engineering Co., Wickliffe, Ohio, has granted to Nelson J. Leonard a franchise to cover the entire northwest territory, working out of Seattle. He has long represented Cleveland Tramrail overhead materials handling equipment in the state of Washington.

• **Carboloy Co., Inc.,** Detroit, has appointed McConkey-Docker & Co., Phoenix, Ariz., as distributor for Arizona.

Infiltrated Metal Powder Jet Blades Boost Production, Save Scarce Materials

CLEVELAND—Jet blades with extreme strength and density, plus improved heat transfer properties, are being produced here by the Metallurgical Products Division of Thompson Products, Inc., utilizing iron powder and copper alloy infiltration.

Properties may be produced within almost any desired range (i.e. high ductility-low ultimate strength or low ductility-high ultimate strength). Normal range resembles steel alloys, with ultimate strength from 60,000 psi to 130,000 psi.

Copper infiltrated blades have an inherent damping characteristic which resists vibration. This is 3 to 4 times greater than 403 stainless; 8 times better than carbon steel blades.

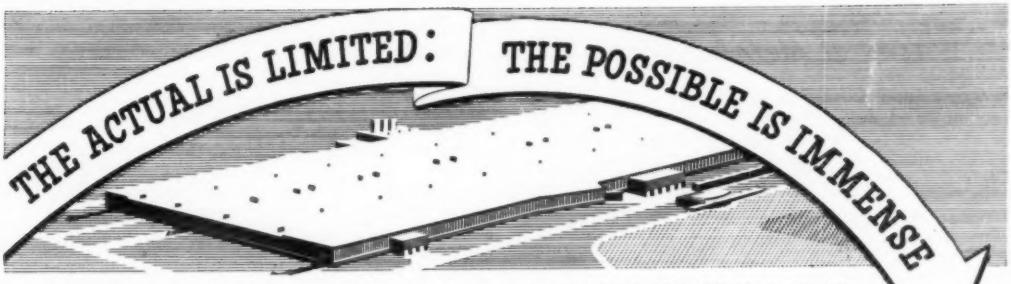
Dr. Paul Schwartzkopf and his staff at American Electro Metal Corp., Yonkers, N. Y., cooperated with Thompson engineers to work out this technique. Cemented carbides are carbide particles bonded by critical cobalt. The Thompson process goes beyond that in using copper alloy for the bonding of iron particles. However, in the former the bonding material is mixed with the original powder before pressing, while the Thompson method infiltrates the bond in liquid form after sintering. Capillary attraction draws the molten copper throughout the porous iron part.

Using a fine-mesh iron powder (to which has been added stearic acid, to facilitate powder flow in pressing) and a special copper alloy, process sequence is: 1. Press; 2. Sinter; 3. Coin to exact contours; 4. Infiltrate; 5. Straighten; 6. Blend edges on belt polisher; 7. Heat treat to develop mechanical properties; 8. Straighten and re-heat treat; 9. Broach dovetail in root; 10. Polish and nickel plate; 11. X-ray and Zyglo inspection. Powder is stored and mixed in an air-conditioned room prior to processing.

AIEE Holds Winter Meeting

NEW YORK—Sixty technical sessions devoted to advances in the field of electricity and allied arts will be held at the winter general meeting of American Institute of Electrical Engineers in the Hotel Statler here Jan. 22-26.

Some of the topics: electronic instruments, instruments and measurements, arc welding, resistance welding, feedback control systems, and rotating machinery. A feature of the meetings will be a panel discussion on functioning of the nation's utilities in case of military attack.



NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

© LE Co. 1951

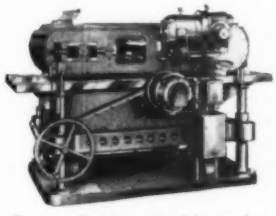
MACHINE BUILDER CUTS DEFLECTION 80%

BASIC objectives of increased rigidity and greater machine accuracy are today being achieved at lower cost with welded steel designs. As illustrated in the redesign of the Facing Planer for the Porter Machinery Company, the present welded steel table when supported on three corners indicates a deflection of only .014" where as the former cast construction sagged as much as .070". Simultaneously, a reduction in weight from 410 lbs. to 320 lbs., made possible by the increased stiffness of welded steel, enables a tolerance of .001" to be maintained on surface flatness.

How to Steel Design With Welding is presented in the new 9th Edition "Procedure Handbook of Arc Welding Design and Practice." Contains latest data on machine design together with cost figures. Price only $2.00 postpaid in U.S.A.; $2.50 elsewhere.

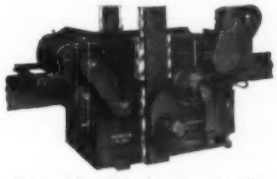
Left: Checking table deflection at Porter Machinery Company, Grand Rapids, Michigan. Center: Unsupported corner of former 36" planer top sags .070". Right: Present welded steel table deflects only .014".

the ACTUAL



Former Design. *Had heavy base serving no other purpose than to unify planer.*

increasing the YIELD



Present Steel Design *has rigid box-type base . . . eliminates costly weight.*

the IMMENSITY of the POSSIBLE

HIGHER MACHINE ACCURACY

SEE HOW WELDED STEEL CUTS MATERIAL NEEDED

Machine Design Sheets free on request to designers and engineers. Write Dept. 101,

THE LINCOLN ELECTRIC COMPANY

CLEVELAND 1, OHIO

• **Parker Appliance Co.,** Cleveland, has purchased Eaton Screw Products Co., Eaton, Ohio, for the exclusive manufacture of steel tube fittings for industrial hydraulic use.

• **Dodge Mfg. Corporation's** two subsidiaries, Chicago Thrift Co. and Etching Co. of America, have completed consolidation of their operations in the plant of the former at 1555 North Sheffield Ave., Chicago, and have been legally merged under the name of Chicago Thrift Etching Corp.

• **American Screw Co.** has combined with local capital in Chile for fabrication of bolts, nuts, rivets, wood and metal screws. Operating under the name Fabrica de Pernos y Tornillos American Screw (Chile) S.A., the plant makes cold-worked products from Chilean brass and cold and hot rolled steel stock.

• **Worthington Pump & Machinery Corp.,** Harrison, N.J., has acquired the land, buildings, and equipment of National Transit Pump & Machine Co. in Oil City, Pa., which is in process of dissolution.

Two Films on Atomic Defense

NEW YORK—Two functional 16mm films for atomic defense—"You Can Beat the A-Bomb." and "Patterns for Survival"—were reviewed recently by AMERICAN MACHINIST editors.

Both provide an educational message believed to be not available from any other source. They are not industrial films, but were produced to show the individual what he can do to protect himself at home, at work, or in the streets if faced with an atomic explosion. Described in the films are advance protective measures, as well as emergency measures, and steps to take after an explosion.

"You Can Beat the A-Bomb" was produced by RKO Pictures, is distributed by Textfilm Dept., McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York. Running time is 20 min., price (black and white) $80 for 10-year lease.

"Pattern for Survival" was produced and is distributed by Cornell Film Co., Paramount Bldg., 1501 Broadway, New York. Running time, 20 min., price (black and white) $100; (color) $200.

Unanticipated Maintenance Is Plant Engineers' Biggest Problem

CLEVELAND—Performance of unanticipated maintenance in metalworking plants "is constantly disrupting what might otherwise be an orderly maintenance plan." There is a "never ending flow of demands from operating personnel for tools, fixtures, guards, minor changes, experimental gadgets, safety devices, and office facilities."

That is Metalworking's "biggest struggle" in maintenance, declared F. A. French, chief plant engineer of John A. Roebling's Sons Co., Trenton, N.J., speaking at the Plant Maintenance Conference held here Jan. 15-18 concurrently with the Plant Maintenance Show.

The speaker outlined a 13-point program that would permit a chief plant engineer "to have the best chance of doing a good job of plant engineering and maintenance." Some of the points:

1. Assign at least one qualified and experienced plant engineer to each major plant division.

2. Have a central engineering office with senior specialists for each of the principal categories of plant engineering.

3. Have an experienced maintenance superintendent in charge of all crafts and other maintenance labor.

4. Have a good centrally located maintenance and construction shop, with plenty of room for good housekeeping and good working conditions.

5. Have a cost system such that all maintenance labor and material can be charged against individual machine units or groups.

More than 150 companies displayed at the show thousands of new products designed to cut industry's maintenance bill.

The program included talks on inspection procedures and frequencies, training people for maintenance work, maintenance problems of the small plant, maintenance costs, and incentive payments for maintenance workers.

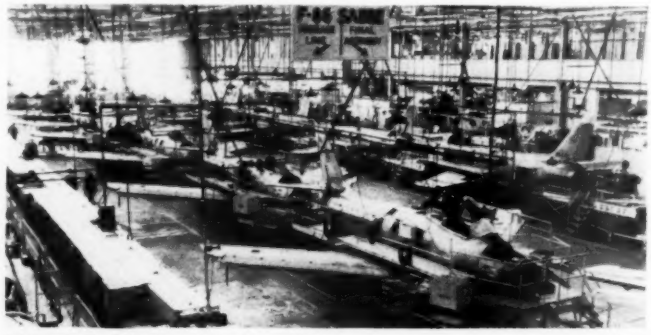
The conference was sponsored jointly by American Society of Mechanical Engineers and Society for Advancement of Management.

AF Orders Huge Presses

DAYTON—The Air Force has announced purchase of two giant hydraulic presses the largest and heaviest ever built, from Loewy Hydropress Co., New York. Towering six stories high, the presses will have a capacity greater than 50,000 tons. Russia now has the world's largest die forging press, a 33,000-ton press built in Germany and taken over by Russia as reparations.

The presses will make it possible to produce entire wing sections at one working of the press. Wing sections are now fabricated from many separate parts, fastened with countless numbers of rivets.

Plans for the presses came out of Air Force experimental work at its manufacturing methods pilot plant at Adrian, Mich.



NEW F-86E SABRE jet fighters with "all flying tails" are rolling off assembly lines at North American Aviation, Los Angeles, giving the Air Force a new version of the present top line fighter, the F86A Sabre, which has been racking up aerial victories over Red MIG-15 jets in Korea

World's finest and fastest hole producer

LELAND-GIFFORD
No. 2LMS
Motor Spindle Drilling Machine

In the range where both quantity and quality count — holes from 1/16″ to 3/4″ — the Leland-Gifford No. 2LMS has earned an unqualified reputation for fast, accurate, economical production. Available in any combination of spindles from one to six; swings of 14″, 20″ or 26″; and speeds up to 3600 RPM, it offers a basic machine which we can readily adapt to your specific needs.

Write for Complete Information

PRECISELY ADAPTED TO YOUR NEEDS

Production drilling **Reaming**	Sensitive hand lever feed with ratchet adjustment or semi-automatic power feed with three feed rates and positive, adjustable depth stop.
Facing **Deep hole drilling**	Plain or Step-by-Step hydraulic feed with infinitely adjustable feed rate and automatic overload release.
Tapping	Reversing motor or high speed, ball bearing friction attachments for tapping at drilling speeds.

PRODUCTION MEN

Get this Handy Slide Rule

A valuable aid in figuring costs and setting production schedules. Quickly gives time required to drill holes of any size and depth in any material. It's free. Write the nearest office

SAVE TIME — **CONTACT THE OFFICE NEAREST YOU**

LELAND-GIFFORD
Drilling Machines

WORCESTER 1, MASSACHUSETTS, U.S.A.

PLANT EXPANSION

• **Precision Metalsmiths, Inc.,** Cleveland, has begun construction of a new plant which will expand present facilities 400% to meet increasing demand for the company's production of small and intricate parts through the "lost wax" process. Occupancy of the new site at 1081 E. 200th St. is expected by end of March.

• **Westinghouse Electric Corp.** will build a new plant for production of small electric motors in Union City, Ind. Ralph E. Davis, plant superintendent of the Westinghouse small motor plant at Bellefontaine, Ohio, will be in charge of the new plant. The Westinghouse Small Motor Div. in Lima, Ohio, will also be expanded to produce machined parts needed at the main Lima plant for military production.

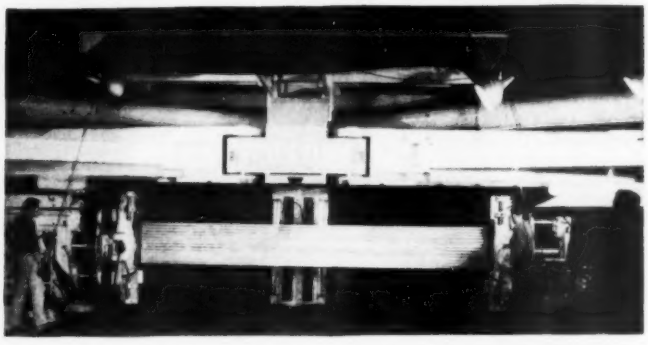
• **Heppenstall Co.,** Pittsburgh, has purchased from Harkit Corp. the William Leard Corp. plant in New Brighton, Pa., to expand production of steel forgings. The new facility has 60,000 sq ft of manufacturing area under roof. Heppenstall might eventually convert the plant for specialized production of forged steel alloy discs used in jet aircraft engines and gas turbines.

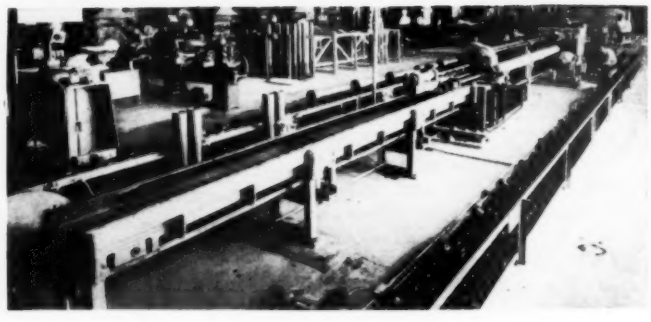
• **National Tube Co.** will install a large extrusion plant for manufacture of high alloys seamless specialty tubes, as well as shapes and bars, at the Gary Works, Gary, Ind. The facilities, to be housed in an existing building at the plant, will include a 2500-ton hydraulic extrusion press for production of tubes ranging from 1½ to 6½ in. dia, with wall thicknesses up to ¼ in. and lengths up to 60 ft. The recently developed French Ugine-Sejournet process for hot extrusion of metals, using glass as a lubricant, will be employed in the operation.

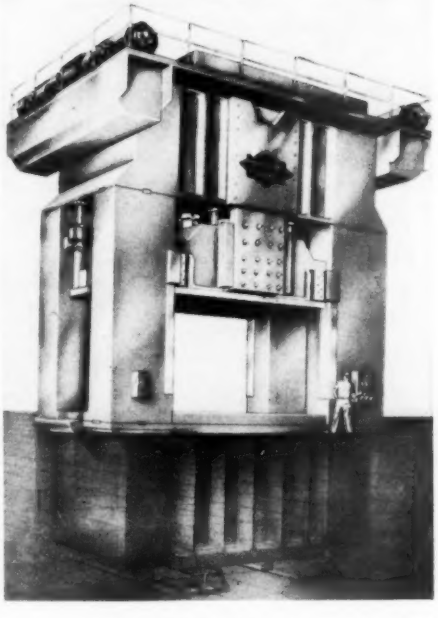
• **Reed Mfg. Co.,** Erie, Pa., has placed its No. 2 plant in full service. The new plant, at 421 West 12th St., adds 37,000 sq ft of production space. It is fully air conditioned and completely equipped for high speed, precision machining of metal parts for vises and pipe tools.

• **Whitehead Metal Products Co., Inc.,** Baltimore, has moved its metal warehouse to enlarged and improved quarters at 4300 E. Monument St.

These Giants are Used to Produce Aircraft







TYPICAL of complex, costly machines required to manufacture today's aircraft are these three giants.

Top — Lockheed's $318,000 Hufford stretch press is used to form heavy skins, stringers and longerons in one operation.

Middle — Hamilton Standard uses this Wallington tube reducing machine for cold rolling the cores of hollow steel blades, increasing their length by 2½ times and decreasing their wall thickness to a tenth of the former dimension.

Right — Birdsboro 8000-ton hydraulic press, in artist's conception, was ordered by Lockheed at a cost of $750,000

This man...

BRINGS YOUR WORLD TO YOUR DOOR!

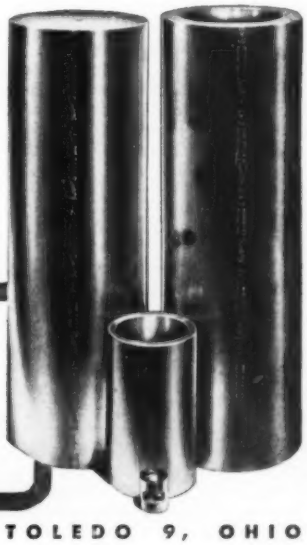
Three billion dollars worth of industrial equipment, tools, and supplies is quite an order even today. Yet there is a man in these United States who alone supplies to you and other customers approximately three billion dollars worth of such commodities every year.

Consider what it would cost in time, trouble and money every year for you and other manufacturers to find and bring to your plants this enormous quantity of things you use in your business.

Serviceable

"This man" is an industrial distributor or a specialist in certain industrial items. You will find him listed in the classified section of your telephone book—most likely under the heading Bars, bronze or Bearings, bronze. If he is the leading distributor, he almost certainly is the Bunting Distributor. He carries in stock for your money saving convenience Bunting Standard Stock Industrial Bearings, Electric Motor Bearings, and Precision Bronze Bars—ask him for catalog.

There are approximately 2,000 Industrial Distributors serving every industrial section of the United States. In 1948, their total sales were more than $3,000,000,000. They carry an average inventory investment of $500,000,000, turn their stocks over 5 to 6 times per year, fill 200,000 orders per day, have 12,000 outside salesmen and engineers, 10,000 inside telephone order expeditors, operate 8,000 trucks delivering merchandise on which their average net profit is .0292 cents per dollar of sales.



Bunting®

BRONZE BEARINGS • BUSHINGS • PRECISION BRONZE BARS

THE BUNTING BRASS & BRONZE CO., TOLEDO 9, OHIO

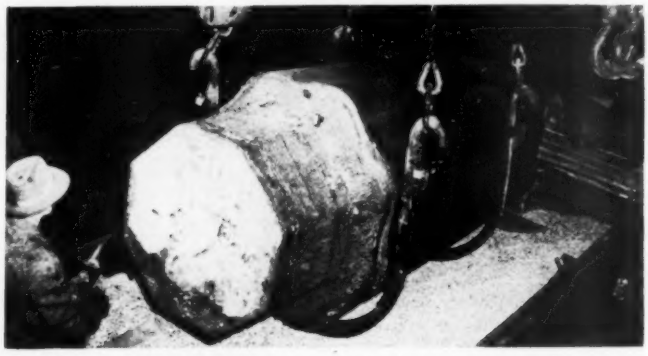
• **PLANES SUBCONTRACTED**—More than 63% of airframe cost of all Air Force airplanes now under contract for manufacture by Boeing Airplane Co., Seattle, goes to subcontractors and to parts and material suppliers. Heaviest volume of subcontracting, Boeing announces, has been in connection with the B-47 Stratojet program at Wichita.

• **STANDARDS APPROVED**—The American Standards Association approved 149 standards in 1950. Of these, 66 are new and 83 revisions of standards previously approved. In addition, the association reviewed and reaffirmed 24 standards without change. The 66 new standards bring the total of American Standards in effect to 1139.

• **SMOKE WASHING DEVICE**—An $18,000 custom-built smoke washing device, part of an $80,000 cooperative research project by 42 Los Angeles County gray iron foundries, is under test in Los Angeles. If proved successful, it will be the prototype for similar units to be installed at various Los Angeles foundries. The test unit was installed at Robertson's Apex Steel Corp., Ltd.

• **DEALERS TO MEET**—The industry-meeting of dealers in rebuilt, reconditioned and used machine tools has been set for Feb. 8-9 at the Wardman Park Hotel, Washington, D. C. Machinery Dealers' National Association has announced. The meeting, open to members and non-members alike, will be addressed by speakers from the Defense Mobilization Board, Defense Production Administration, in addition to speakers from ESA, NPA, and NSRB.

• **NMTA COMMITTEE NAMED**—National Metal Trades Association has appointed members to its Industrial Engineering Committee for 1951. Named to the committee: A. S. Davis, Dexter Folder Co., Pearl River, N.Y., chairman; John J. Hall, personnel administrator, Brown & Sharpe Mfg. Co., Providence; W. L. Johnson, vice president, Bell & Howell Co., Chicago; Robert C. Jones, assistant to treasurer, Crousse-Hinds Co., Syracuse, N.Y.; and W. E. Rutz, executive vice president and works manager, Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.



WHITE-HOT STEEL INGOTS may now be shipped, with a saving of two months' processing time, through use of vermiculite insulation in a railway flat car. Here a 130,000 lb ingot is lowered into a Canadian National car at the Sydney, Nova Scotia plant of Dominion Iron & Steel, Ltd., for a 200-mile trip to the Trenton Steel Works in Trenton, N.S. Car is filled with vermiculite, a mica-like mineral, processed by Zonolite Co., Chicago. Ingots are shipped at a temperature of 1600 F.

Work Started On Saco-Lowell Plant

BIDDEFORD, Me.—Grading is already underway for the new 288,000-sq-ft plant of the Saco Products Division of Saco-Lowell Shops, here, on a 160-acre site in Saco, Me. Completion is scheduled for this Fall. Austin Co. is building the plant, actually designed as the first unit of a million-sq ft, single-story, windowless structure, 600-ft wide, which will replace present local buildings of this division.

Several unusual elements are incorporated in the design. Walls are brick for 10 ft, topped by corrugated asbestos. The roof deck will be pre-cast concrete composition slabs with high insulating properties, covered with pitch and slag waterproofing.

Two railroad spurs will enter the building along opposite sides, one for receiving materials and capable of handling two cars, the other for shipping and capable of handling ten. At the end of each spur is a shipping dock for trucks and trailers. Thus materials and parts will progress across the floor through rough and finish machining, subassembly, finishing and assembly. Present plans are for functional subdivision of the working floor, foremen each being responsible for a zone of like equipment rather than for a product line.

For the present, offices will be in a small two-story area on one side, and this area will have windows. All the rest will be single-story, with no basement, insulated slabs laid on the ground giving 1000 lb per sq ft bearing, ten times that of the old building. Fluorescent lighting and forced-air heating and ventilating will be used throughout.

Eutectic Celebrates 10th Anniversary in U.S.

NEW YORK—New welding alloys are in the testing and pilot run stages and will be made available shortly by Eutectic Welding Alloys Corp., Flushing, N.Y., President R. D. Wasserman announced recently on the occasion of the company's tenth year of operation in the United States.

At the same time, the company announced construction of a new engineering and general offices building, to be ready for occupancy by March, 1951. The building will expand the free consultation-demonstration service now rendered through a 200-man field force.

Eutectic's low temperature welding alloys were developed from principles discovered by J. P. H. Wasserman in 1906 in Switzerland, the Eutectic president said.

"The year 1950 has been a banner year for the company," Mr. Wasserman said. Production of welding rods has been enlarged to meet the heavy demands of industry, and the new plant will increase potential capacity to more than five times that of the former plant.

. . . IT'S ONLY ONE OF REPUBLIC'S MACHINING AIDS FOR STAINLESS STEEL BAR USERS

There's no question about proper machining practices for Republic ENDURO Stainless Steel Bars when you use this handy *Cutting Speed and Feed Selector*. Simple to use, it gives recommended feed/speed ratios for eight different stainless steels, including the ENDURO Free-Machining grades.

Republic's other machining aids include personal contact assistance by veteran machining experts and stainless steel metallurgists. Whatever your problem involving the fabrication of stainless steel, these men are ready and well-qualified to help you find the most efficient and economical solution in a hurry.

If you do not already have your FREE *Cutting Speed and Feed Selector*, write today!

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REPUBLIC STEEL

Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

John W. Belanger

Nicholas M. DuChemin

W. R. Persons

Norman F. Smith

Names in the News

John W. Belanger and **Nicholas M. DuChemin** have been named general managers of the Large Apparatus Divisions and Small Apparatus Divisions, respectively, of the General Electric Company's Apparatus Dept. Both will be responsible to **Henry V. Erben,** G-E vice president. Formerly, they were assistant general managers of the department. The appointments mark an integration of the Apparatus Dept. into three basic units: Large Apparatus, Small Apparatus, and Marketing Divisions, with the latter operations continuing under **Chester H. Lang,** vice president. Other recent appointments: **Henry A. Vaughn,** manager of manufacturing, Meter & Instrument Div., Lynn, Mass.; **Emil R. Schaeffer,** manager of manufacturing, Switchgear Div., Philadelphia; **Joseph F. Eckel,** manager, Large Motors & Generator Div., Schenectady; **J. M. Crawford,** manager, Transformer & Allied Product Div., Pittsfield, Mass.; **Herbert L. Ross,** manager, River Works, Lynn.

Alphons A. John has been named to head a newly created employee-public relations office at Kearney & Trecker Corp., Milwaukee. He will continue also as advertising director of the K&T machine tool manufacturing plant. The new department was formed to bring about "a closer coordination in relationship between employees, stockholders, customers, and suppliers of Kearney & Trecker, and the community," it was announced.

Robert L. Pettibone has been named chief metallurgical engineer, Sintercast Corp. of America, Yonkers, N. Y.

W. R. Persons has been elected vice president in charge of sales, Lincoln Electric Co., Cleveland. He has been general sales manager since 1946, joined Lincoln in 1934 as a welding engineer. Other appointments: **James William Brooks,** transferred from the Boston district to sales and engineering responsibilities in the Indianapolis district; **Thomas L. Dempsey,** field engineer, Cleveland sales office; **John F. Kotchian,** welding engineer, Chicago district.

J. Richardson Dilworth has been elected to the board of directors of Rockwell Mfg. Co., Pittsburgh. Since 1946 he has been with Kuhn, Loeb & Co., New York. He is also a director of Concrete Brick Co. and Carbon Limestone Co., both of Lowellville, Ohio.

L. V. Johnson has been named chief engineer, National Tube Co., Pittsburgh, succeeding **John L. Young,** elected vice president-chief engineer of the newly formed United States Steel Co. Mr. Johnson was formerly assistant chief engineer.

James H. Hopkins has been named vice president and director of the new Hazelton Steel & Tubing Corp., Hazelton, Pa. He will do engineering and research work for the firm, whose plant is expected to be in operation by September, with a capacity of 120,000 tons of seamless steel tubing annually.

John R. Suplee has been placed in charge of resistance welding sales for J. A. Cunningham Equipment, Inc., Philadelphia, distributor for Acro Welder Mfg. Co.

Norman F. Smith has been elected president, Osborn Mfg. Co., Cleveland. He has been vice president and general manager since 1938. **Franklin G. Smith,** founder and president since 1892, was elected board chairman. A 25-year veteran with Osborn, Mr. Smith became assistant manager of Rubico Brush Manufacturers, Inc., New York, in 1927, an Osborn division. In 1935 he became treasurer of Osborn.

Russell S. Easterday has been named president and general manager of F. C. Thornton Co., Cleveland. He was formerly vice president and general manager. **George Leppert** was elected vice president and treasurer, and **L. B. Parks** was named secretary.

John F. Costigan has been named assistant works manager of Allis-Chalmers Mfg. Co.'s Norwood (Ohio) Works. Since 1945 he has been assistant to the general works manager, Manufacturing Dept., General Machinery Div. **N. W. Landis** has been named manager of the Detroit district office, succeeding **F. S. Schuyler,** retired. **A. J. Mestier, Jr.,** sales representative in the New York office, succeeds Mr. Landis as manager of the Syracuse office. **Kenneth R. Geist** has been named director of purchases, succeeding **Fred E. Haker,** retired.

Arthur Kellerman has been named assistant general superintendent, Division One, Stewart-Warner Corp., Chicago, succeeding the late **Alfred Iversen.** Mr. Kellerman was general foreman. He joined Stewart-Warner as toolroom apprentice in 1928.

William G. Dawson has been named manager of the newly established Industrial Chrome Div. of Ward Leonard Electric Co., Mt. Vernon, N. Y.

SNYDER MACHINES CONTROL COSTS

TYPICAL INDUSTRIES USING SNYDER-BUILT MACHINES

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- Electrical Manufacturing
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- Valve Manufacturing
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Robert W. Snowden

Earl C. Hughes

Charles W. Jinnette

Otto Hecht

Robert W. Snowden has been named plant manager of the recently-acquired New Brighton Works of Heppenstall Co., Pittsburgh. Mr. Snowden, who joined Heppenstall in 1936, developed the firm's standards for testing steel with the Sperry super-sonic reflectoscope. **Howard Kuhn** has joined the Heppenstall sales department.

Edmund A. Watson has been named assistant to vice president, American Car & Foundry Co. He will be engaged in manufacturing activities of the Production Dept. **Robert A. Harris** has been named chief improvement engineer of the Production Dept. **Harry J. Leddy** has been elected executive vice president, and **John B. Davenport** has been named vice president in charge of sales, Shippers' Car Line Corp., an ACF subsidiary.

A. D. Sheere has been named manager, San Francisco Div., A. M. Byers Co., Pittsburgh, succeeding **P. D. Tabler,** retired. **N. L. Brown** succeeds Mr. Sheere as manager, Houston Div.

Richard E. White, formerly a Navy commander in charge of the Bureau of Aeronautics' Power Plant Div., has been named chief administrative engineer, Metal Products Div., Ryan Aeronautical Co., San Diego. Prior to entering the Navy in 1942 he was with Wright Aeronautical Corp. for 14 years, part of the time as vice president and treasurer of Wright Aero, Ltd., West Coast subsidiary.

R. D. Redner has been named sales representative, Detroit Diesel Engine Div., General Motors Corp., covering Minnesota, North and South Dakota, Iowa, Nebraska, western Missouri and Kansas.

Earl C. Hughes, vice president and executive secretary of Bay State Abrasive Products Co., Westboro, Mass., has been re-elected president of Grinding Wheel Institute.

Dr. Edward M. Pritchard has been named chief electrical engineer, Control Engineering Corp., Canton, Mass. He was formerly chief engineer, Fisher-Pierce Co., and chief applications engineer, Sigma Instrument Co.

James E. Barthmaier has been named district manager of diesel engine sales and service for the New England territory of Enterprise Engine & Machinery Co., San Francisco, with his headquarters in Boston. **Hugh H. Goodwin** has been named sales engineer for Enterterprise's New York branch. Both men were formerly with Superior Engine Div., National Supply Co., Boston.

Alfred T. Duff has been named superintendent, Tin Mill Div., Gary Sheet & Tin mill, Carnegie-Illinois Steel Corp. He succeeds **Thomas W. Hunter,** named assistant general superintendent, Irvin Works, Dravosburgh, Pa.

Capt. David R. Hull, USN (ret.) has been elected a vice president of Raytheon Mfg. Co., Waltham, Mass., and manager, Equipment Div.

Charles W. Jinnette, regional manager of business planning and development in Chicago, Detroit and Cleveland areas for Norton Co., Worcester, Mass., has retired after 50½ years' service.

Otto Hecht has been named production manager, Laminated Shim Co., Glenbrook, Conn. He has been with Laminated Shim for 16 years. Last year he served as methods engineer.

Ray E. Kalmbach has been named general manager, Wilson Foundry & Machine Co., subsidiary of Willys-Overland Motors, Inc. He was foundry superintendent at Nash-Kelvinator, Kenosha, Wis. **William A. Hambley** has been named sales manager for Wilson.

Logan C. Miller, general manager, Rouge Div., Ford Motor Co., Dearborn, Mich., has been named vice president, Basic Products Group. **Ray H. Sullivan,** manager of Automotive Manufacturing Operations, was named vice president, Engine and Pressed Steel Group. **R. E. Krafve** has been named director of a newly established Office of Defense Products. He was formerly manager of the Defense Production Div. **Frank R. Crone** has been named manager of production engineering, Tractor & Industrial Engine Div.

OBITUARIES

Col. Eugene C. Peck, 83, former general superintendent and a director of Cleveland Twist Drill Co., died Dec. 31. He had been actively associated with the firm for more than 30 years.

Henry F. Vlchek, 56, son of the founder of Vlchek Tool Co., Cleveland, and a vice president sice 1947 died Dec. 30.

Michael Dewar, 63, chairman of British Timken, Ltd., died Dec. 21. He was sent to this country in 1940 to get tank manufacturing started for the British. In 1929 he formed a company to manufacture tapered roller bearings in England and became a partner in the venture with Timken Roller Bearing Co., Canton, Ohio.

Hjalmar Ellstrom

INVENTOR OF THE GAGE BLOCK

The achievement of perfection . . . the complete mastery of any art or craft or science . . . is a rare human accomplishment. A discovery or an invention that contributes to the progress and total welfare of all mankind is rarely the heritage left by a single man. So rare is it, indeed, that in such infrequent instances, the true facts surrounding its origin are often distorted, obscured, or even lost in the conflicting claims of others who would seek the personal worldly gains to be derived from undeserved fame.

So it was with the Gage Block. For, actually, this basic standard of measurement now used the world around was originally conceived, developed, and invented solely and entirely by . . . Hjalmar Ellstrom.

Here, briefly, is the story of his accomplishment: During the early 1890's, Hjalmar Ellstrom was employed by the government rifle factory at Eskilstuna, Sweden. He was a master craftsman . . . a man of infinite patience who took great pride in his work. He was a man of vision, too, who recognized the limitations imposed upon industry by the lack of sufficiently accurate measuring devices. So, with a then unheard of standard of precision as his ultimate goal, he alone developed and perfected his checking instruments and techniques . . . then alone he created the world's first gage block accurate to the infinitesimal millionth part of an inch.

Today, though his achievement has been copied and imitated by others, his personal unqualified devotion to accuracy is the exclusive heritage of Ellstrom.

ELLSTROM . . . *measuring in millionths for three generations*

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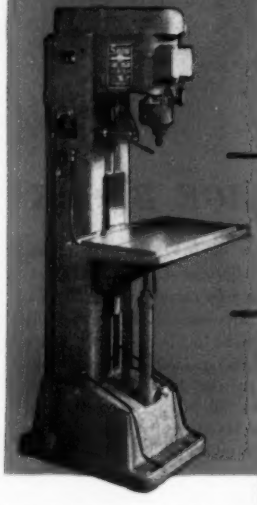
Originators of Chromium Plated Gage Blocks

Never Before

SO MANY ADVANTAGES for HIGHEST PRODUCTION

4800 PER HOUR!
3800 PER HOUR!
2500 PER HOUR!

For Top Production

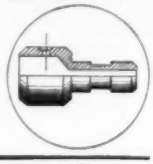


SNOW

FULL UNIVERSAL MACHINES

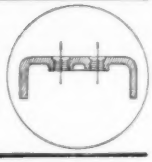
Air operated, electrically controlled Snow tools are establishing amazing production records daily on a wide variety of work. Just note these typical examples:

DRILLING



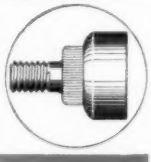
Crossdrill and C'T" Sink 1/16" Hole
Material—Brass
Production—4800 per hour
Fixture—#15 Vertical index
Equipment—#1-UD Drilling Machine

TAPPING



Tap Two #10-32 Holes
Material—Steel stamping
Production—3800 tapped holes per hour
Fixture—#14 horizontal index
Equipment—#1-UT tapping machine

THREADING



3/8"—24 Thread—1/2" Long
Material—Die Cast Aluminum
Production—2500 per hour
Fixture—#10 Drum dial
Equipment—#3-TR Threading machine

Snow air operated—electrically controlled machines have built in full universal controls that allow selection of the type of spindle cycle desired. This feature also permits instant synchronization of the standard Snow Master Fixtures. All types of air operated automatic and semi-automatic jigs and fixtures are carried in stock. Standardization permits low cost tooling—and—high production.

Sensitivity of power application prevents tool breakage.

Simplicity of control means that set up and operation can be handled by a less experienced operator with minimum fatigue.

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MANUFACTURING COMPANY
435 Eastern Ave., Bellwood, Illinois
(Chicago Suburb)

Single Spindle Verticals • Two-Spindle Verticals • Two-Spindle Horizontals • Automatic Nut Tapping Machines • Drill Press Tap Heads • Automatic & Semi-Automatic Jigs & Fixtures

Submit Sample Parts for Production & Cost Estimates

ROUND TABLE Discussion

OUT TO PASTURE

I HAVE always respected old age and I have likewise admired old craftsmen. They have the experience young men desire and need and they have a right to demand attention.

Young men are always in a hurry to be promoted. They think elderly men are in their way, and they demand privileges denied their older comrades. They often look upon men past 40 as too old even to be employed. I know firms where before the war nobody past 40 was hired for any kind of a job. Today conditions have changed so that also men past 50 or 60 must be employed in order to keep the wheels running. The instant times get slack older men, as a rule, are laid off first. The brute strength of the younger is here the decisive factor. I don't think this is right.

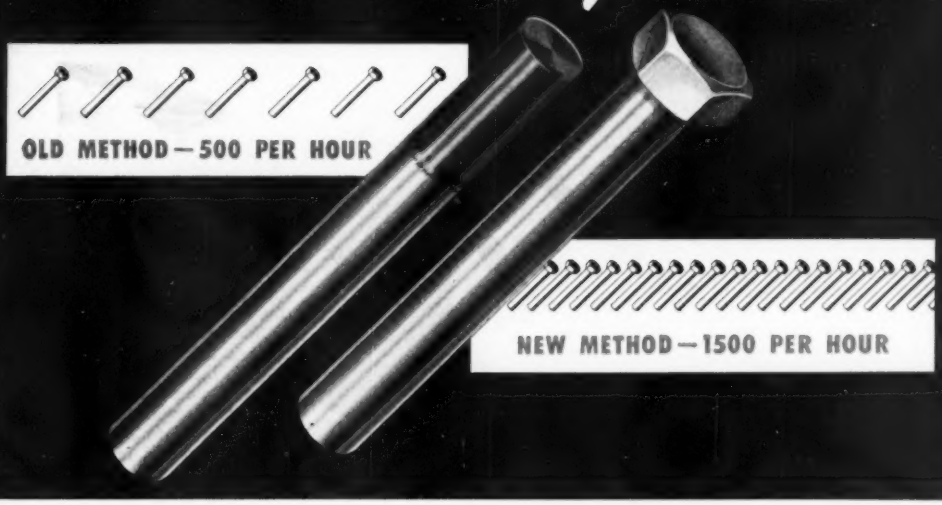
If brains are needed to run the nation's business, why should not an old man have just as good brains as a young one? Look at the presidents of the machine industry; do they give up their jobs to younger men? I think not—if such president owns the majority of the shares. He as a rule resigns only if he is taken ill or other circumstances force him to give up. Why shouldn't his employees have the same right?

Discharging a man who is in good health just because he is 65 years old I think is a crime against society. Why, men past that age are holding the highest positions in many nations. If I am rightly informed, President Truman is 66 and our late King in Sweden was 93. And who could have led Great Britain better than Churchill at 70? Also what about MacArthur?

In our times where all heavy work is done with the help of mechanical devices forced retirement at 65 is foolish. And again, medical treatment now available to everybody keeps men fit for work much longer than only 30 or 40 years ago. When it was generally accepted that men should retire at 65 the life's span was much shorter than today. I think therefore, that all men in good health should be kept on their jobs up to 75 or even longer if they are able to work.

The notion that an old man is useless because he has old-fashioned ideas I cannot accept. There are young men who do not only have

PRODUCTION *Tripled!*



with TOCCO* Induction Heating

THE Northwest Bolt and Nut Co. of Seattle installed a 50 kw 10,000 cycle TOCCO machine, to replace a conventional oil-fired slot type forging furnace, for heating bolt blanks for upsetting. Production on ½" diameter stock zoomed from 500 to 1500 pieces per hour—on ⅜" stock from 250 to 600 per hour.

50 kw 10,000 cycle TOCCO machine heating bolt blanks

ADDED ADVANTAGES

1. Uniform heating for better quality—fewer rejects
2. Much longer die life due to reduction of scale
3. Very low maintenance—compared with rebuilding brick-lined furnaces
4. No heating-up time required with TOCCO
5. Absence of heat and noise—for better working conditions

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Why not have a TOCCO engineer find out how TOCCO can help reduce *your* forging, brazing, melting or hardening costs—no obligation.

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NEW **FREE** BULLETIN

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Company _____

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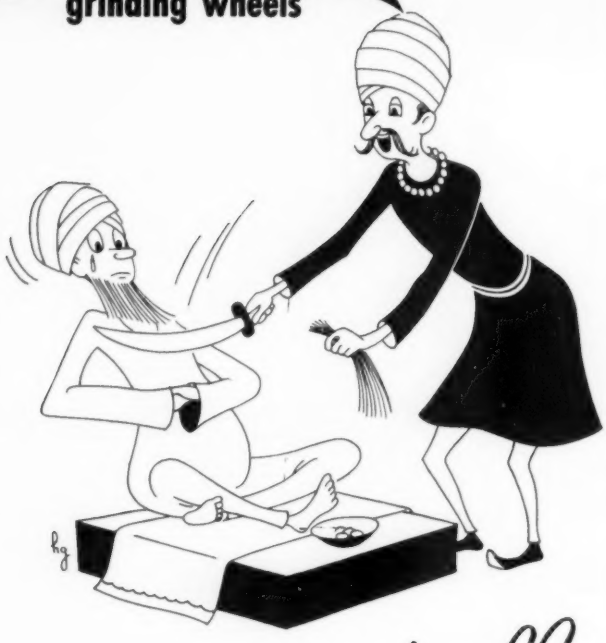
ABRASIVE CO.
grinding wheels



Fast cut-off

For quick, safe 'cut-off' here's the tip-off . . . Simonds Abrasive Company cut-off wheels. They slice through tough metals . . . pare down costs and lop time off your jobs.

These rugged wheels are only a few of the many production tools in Simonds Abrasive Company's complete line of grinding wheels and abrasive products. They're described in our free data book along with grinding wheels of every size and shape . . . mounted wheels and points . . . segments . . . abrasive grains . . . top quality products backed by Simonds Abrasive Company's reputation as a major grinding wheel manufacturer for over 50 years.

SIMONDS ABRASIVE COMPANY, PHILADELPHIA 37, PA. DISTRIBUTORS IN PRINCIPAL CITIES

Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N. Y., Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.

old-fashioned ideas, but some have no ideas at all. And it would be easy to pick many highly efficient and up to date men past 70.

All men at 65 cannot perhaps get the chance of instructing young apprentices like Harrison, but there are always jobs that old men can do and it is a loss to any company if such men are retired just because they have reached that age.

A. E. Fristedt
Stockholm, Sweden

•

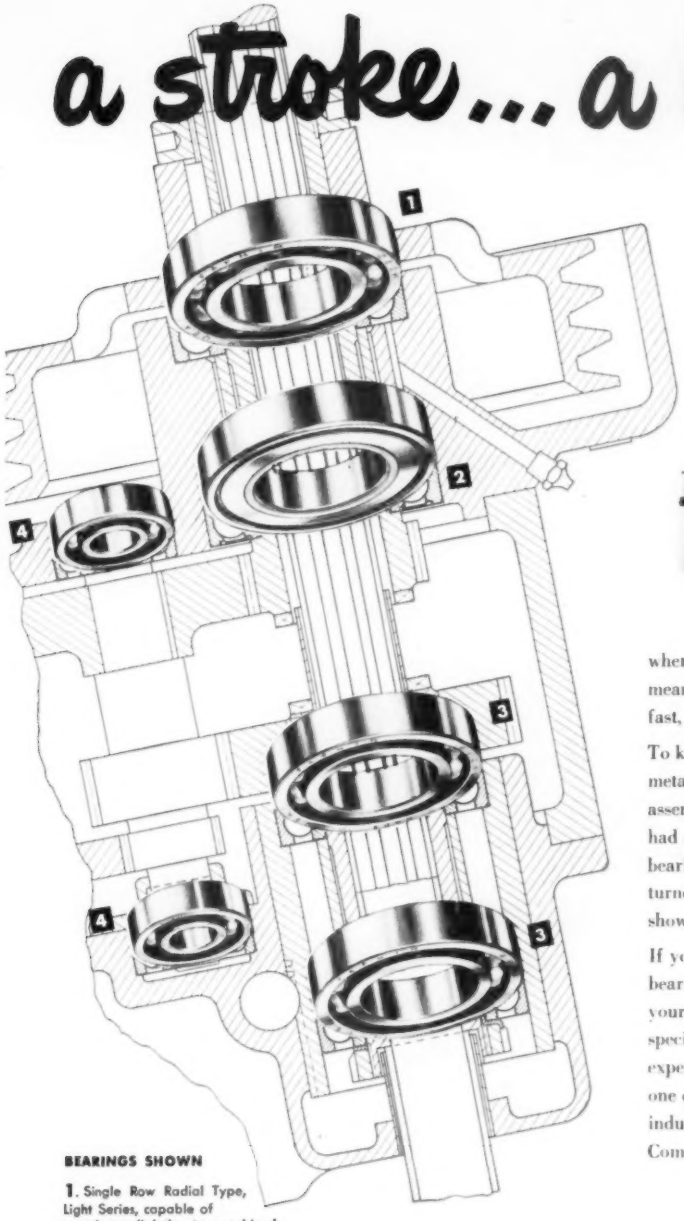
YES, old "horses" are put out to pasture when they are no longer able to trot quickly or to draw heavy loads. No argument can be raised against this practice; else, they could be sent to make dog food. Perhaps the parallel ends here. It may be the engineer is a little higher in the animal world than the "hoss," noble though that animal is said, in the copybooks, to be. The horse is a creature whose value lies in the quality of his brawn. Should he have the glimmerings of a brain, this must be kept, well reined, in the background.

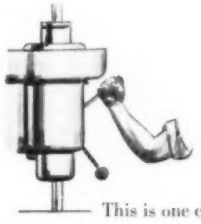
Not so, however, the engineer; he has a brain which, although it may be undervalued, is not reined, has value; gains experience and is capable of independent thought. "Experience," says the proverbs, "makes even fools wise," and "comes with ripe years." Has this no greater value than brawn? Is it to be measured by the same factor, the number of times it has seen the sun rise? It may be that the possession of gray matter is not considered necessary; that, if available, automatons would fill the bill and these, with suitable repairs could go on forever, thus eliminate the need for pastures. Would men who thought this be putting themselves in the ranks of those "who know not, and know not that they know not"? Such men are said to be fools who should be shunned.

The writer once went to a works where the work given him was part of a major operation, the important part of which was to turn a number of grooves in X inches on cast iron cylinders. These were turned on another lathe in another shop. They varied in number and were often of most odd widths. It was thought that the turner who did the job was too old and he was discharged. His successors were unable to do the job; and the foreman could not solve the problem and the firm had to buy a new lathe. Old Harry knew the leadscrew was badly out of pitch, that was all; the foremen did not.

The entrance to a fishing harbor

a stroke... a hole





This is one case where a stroke a hole does not mean a handicap. Instead, it means fast, uninterrupted drilling.

To keep up such a pace in any metal, the maker of this power feed assembly for a drill press knew he had a tough holding job for ball bearings . . . a problem which he turned over to Fafnir. The solution — shown here — worked perfectly.

If your product calls for ball bearings you, too, will find it to your advantage to call in Fafnir specialists because Fafnir's experience is not limited to just one or two industries but is industry-wide. The Fafnir Bearing Company, New Britain, Conn.

BEARINGS SHOWN

1. Single Row Radial Type, Light Series, capable of carrying radial, thrust or combined loads in any direction.

2. Same as above with single grease shield added.

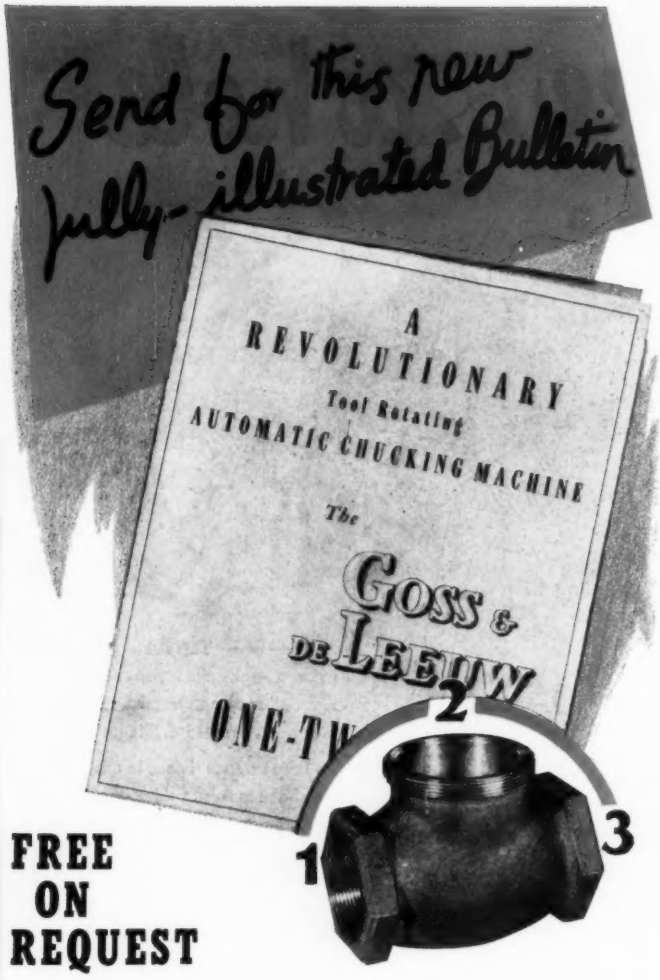
3. Same as No. 1 except the size of bore.

4. Single Row Radial Type, Medium Series. Heavier cross-section than the Light Series . . . capable of withstanding heavy shock loads.

FAFNIR

BALL BEARINGS

MOST COMPLETE LINE IN AMERICA



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Here are the answers to most of your questions as to what "ONE-TWO-THREE" means in describing this outstanding development of Automatic Chucking Machines by Goss and De Leeuw. You'll be interested not only in the revolutionary design of the machine itself, but also in its extraordinary performance—and how it is possible to handle from one to three operations—in sequence or simultaneously without changing set up.

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GOSS and DE LEEUW
MACHINE COMPANY, KENSINGTON, CONN., U.S.A.

was treacherous. When outside, a strong young man steered; when returning to harbor he gave up his place to an old man who could take them safely in. The crew relied on the old man's experience. Experience is dear to buy and should be used as much as possible; its quality cannot be measured by the same standard as brawn and the man who walks fastest is not always the fastest workman.

P. E. James
Lindum, England

•

THERE can be no question about there being many, many cases in which a man 65 years of age (and sometimes well above that point) would be a most decided asset to a company, though this is certainly not true of many others. So much depends on the man himself that any reasonable decision with reference to keeping him can be reached only by considering him as an individual, together with the extent of his detailed knowledge and his seniority with the firm. His physical condition must also be taken into consideration.

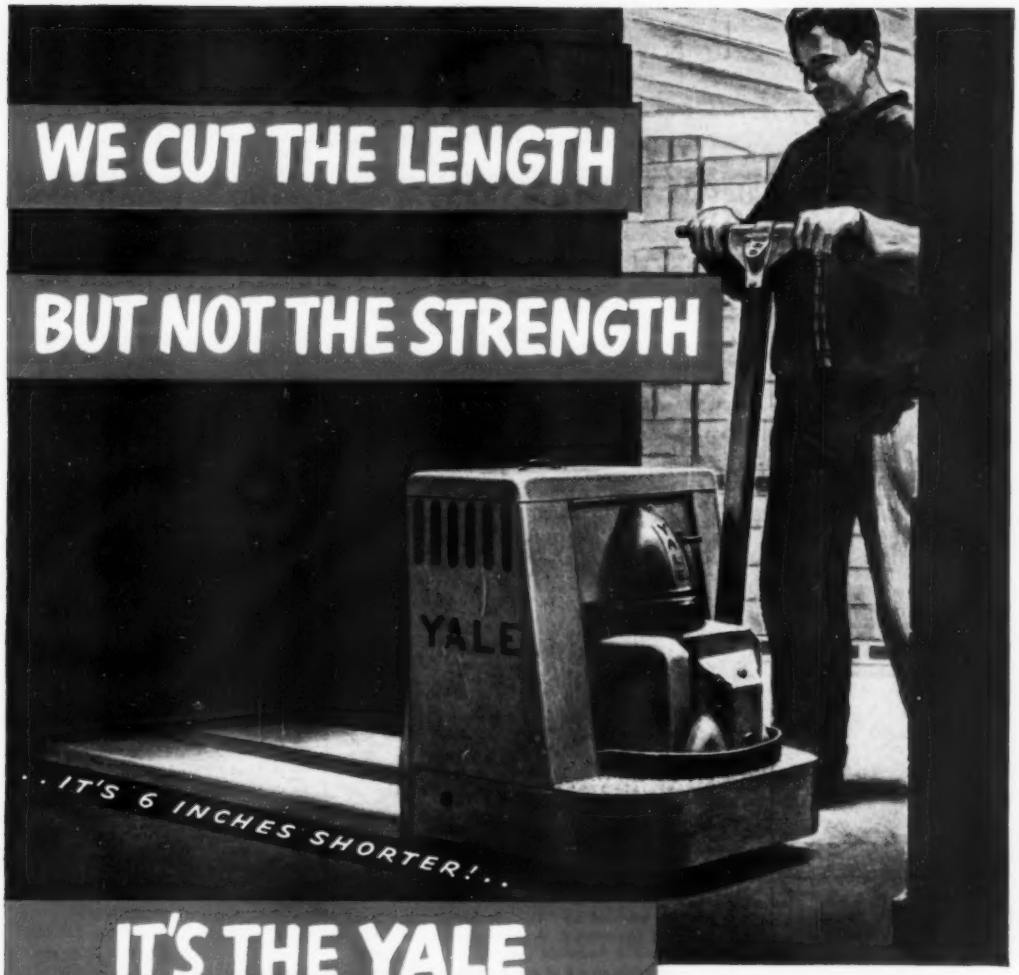
In fact, it is the degree of probability that a man will not often be in as good physical condition after reaching the age of 65 that has been foundational in bringing about establishment of a retirement age. Insurance companies are definitely cold blooded with regard to risks they take, balancing them squarely against the dollar.

When one thinks this matter over carefully, it is not difficult to see that many an industrial firm would do much better to establish a fund to take care of their own insurance risks. If a company would continuously pay the very same insurance premiums into a fund preliminarily set up in modest proportions, it would leave them entirely free to consider each individual on the actual merits of his case, instead of setting a hard and fast rule on age of retirement. Doing this would militate in their favor in more ways than one. Realization of men in general that their actual condition and value would be the measuring stick as to how long they were to be retained, rather than actual years of their age, would tend to hearten them. It would keep them on their toes both in the matter of taking better care of themselves, and that of becoming more skilled.

It is believed that an occasional older man would make the very best kind of an instructor, though we cannot overlook the fact that many

WE CUT THE LENGTH

BUT NOT THE STRENGTH



IT'S THE YALE *WORKSAVER* "STUBBY"

RIDE IT OR WALK IT

TRADE YALE MARK

Lifts and carries maximum loads in narrow aisles, boxcars, highway trucks!

Small enough to go where bigger trucks can't—so maneuverable it can turn in its own length—yet strong enough to carry loads of 2,000 to 6,000 lbs! That's YALE'S WORKSAVER—"STUBBY."

It speeds up your materials handling on hard-to-get-at jobs, gives you more storage room because it needs less aisle space.

A powerful electric drive unit and a rugged welded steel frame keep this truck on the job for years with a minimum of "down time." It's remarkably safe and easy to operate, too. Controls for hoisting, positive action safety brakes, and two-speed drive in either direction are all built into the steering handle.

Our representative will be glad to show you how all of these advantages add up to real savings of production time and money for you. *Just send us the coupon today.*

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THE YALE & TOWNE MANUFACTURING COMPANY, PHILADELPHIA 15, PA.

older men tend to discount the value of newer machines and newer methods. Again it depends on the man. Older men could also be used for janitor service, for watchmen, for various lighter types of work, and in some few instances as supervisors. Undoubtedly if all the work in the usual organization were subjected to study, there would be many places found where older men could be very profitably used, especially if they were willing to accept a reduced wage in view of their advanced years.

Once such a method became established with a given firm or group of firms, it would not be difficult for men retained past the age of 65 (or any other given age adopted for use) to make the necessary readjustments, mentally and otherwise, to step down to somewhat lower wages to compensate for the fact that their insurance risk is inevitably higher and their physical powers are inevitably somewhat lower. When one knows in advance that this is to be faced, he comes up to the time fully prepared, fully realizing it is no reflection on him or his ability as such.

John E. Hyler
Peoria, Ill.

•

"I AM long on ideas, but short on time," said Thomas Edison. "I expect to live to be only about a hundred."

Of course we are all not cast in the same mold as was Edison. But his belief in the theory that age does not stunt the birth of new ideas, and that a man over 65 is still valuable to the industrial world, should give pause to those who argue otherwise. His thought is a fine one to remember, and use as a guide, when the question arises as to whether the man over 65 can offer anything to a company that a younger man cannot. Experience, patience, and knowledge cannot be argued away because of overage.

In the case of the man who is entitled to retirement at 65 but who desires to continue working, it would seem that retaining him in a supervisory position in apprentice training is a step in the right direction. This position demands the type of man who has had special experience in the kind of work being taught in that plant, and this man's valuable experience could be used to the mutual advantage of the apprentice and the company.

From a realistic viewpoint, as a general policy, when employees reach retirement age, their further retention in the company must be

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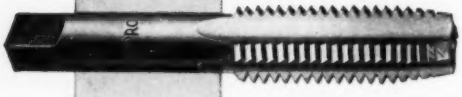
"Sustained TAP Accuracy"
assures
STRONGER FASTENINGS

HY-PRO Taps stay accurate longer to produce threads with uniformly close tolerances. This SUSTAINED ACCURACY effects stronger, tighter, more enduring fastenings that resist the loosening action of vibration. When tapped with SUSTAINED ACCURACY, your threaded parts will give longer, trouble-free service.



HY-PRO Taps provide definite production economies because they stay on the job longer . . . require less sharpening . . . produce more accurately threaded holes per tap. Competitive tests on the job prove this economy aids in offsetting high labor costs through greater production.

Specify HY-PRO Taps for High Production at Less Cost! Their stamina and precision assure every tap user of definite economies, plus sustained accurate threading on the toughest or the most meticulous assignment. Effect these savings and efficiencies in your tapping operations NOW!

If you are troubled by "Threadaches", consult our Engineering Department. A thorough diagnosis will be made and a treatment prescribed by specialists with an enviable record of cures. Just send the symptoms in detail. Prompt recommendation for treatment will be forwarded.

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Send your name to receive the HY-PRO Stock List, mailed bi-monthly on request.

Many Special as well as Standard taps in stock for prompt delivery.

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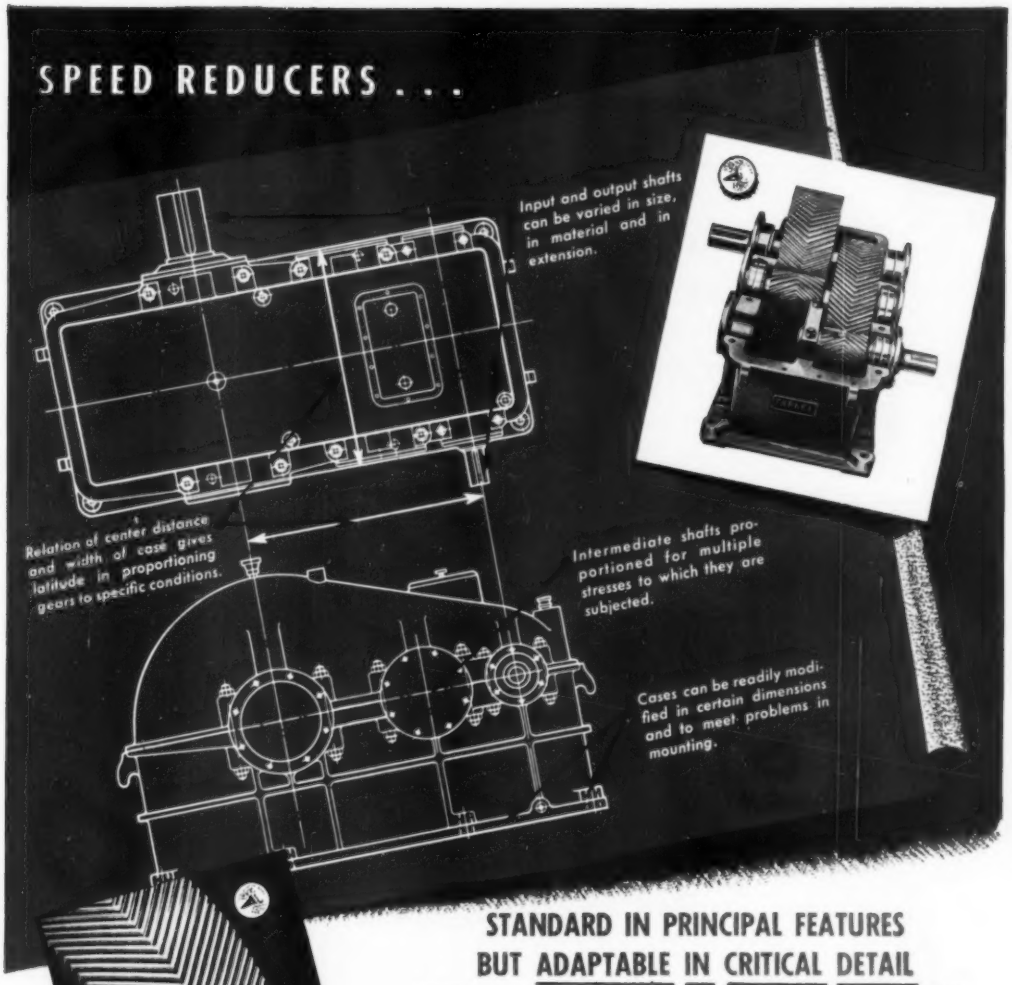
Input and output shafts can be varied in size, in material and in extension.
Relation of center distance and width of case gives latitude in proportioning gears to specific conditions.
Intermediate shafts proportioned for multiple stresses to which they are subjected.
Cases can be readily modified in certain dimensions and to meet problems in mounting.

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The quiet, vibration-free performance you can expect from the herringbone gears used in Farrel speed reducers results from extreme accuracy of tooth spacing, contour and helix angle . . . qualities inherent in the Farrel-Sykes method of gear generation. Precision manufacture and highest grade materials contribute to long gear life.

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Farrel speed reducers have been developed for continuous, trouble-free operation under difficult service conditions. Gears, shafts and bearings are factored to safeguard against interruption of vital processes; gear cases are proportioned to withstand repeated heavy peak loads; joints are sealed to prevent entrance of dust and dirt.

But, that is not all. Without sacrificing the advantages of general standards, the design of these units permits an engineering freedom in proportioning gears, shafts, bearings and even some housing dimensions to meet specific load, speed and service requirements. This flexibility allows an engineering exactness in critical detail, which has resulted in the solution of innumerable application problems.

Write for further details. Ask for a copy of Bulletin 449—no cost or obligation.

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The purpose of the point is to hold the shaft against both rotation and longitudinal motion. The Allen screw with the correct point* does the job best.
Locking is a matter of friction. High uniform accuracy of fit, pitch diameter and perfect thread load assure maximum thread contact. Twelve and a half inches of thread provide one and one half square inches of contact in a ½" x ¾" Allen Head Set Screw.

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* Cup point for most applications. Cone, flat, half dog and oval points are standard Allen points available from stock for special requirements.

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Allen-Type screws aren't necessarily Allen-Made.
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based on individual circumstances, prevailing need of specialized workers, and the record of the individual employee being considered. However, insofar as filling the position of apprentice supervisor is concerned, a younger man would in all probability not possess the experience, patience, and judgment required for the position. The problem of selecting the proper man for this position ceases to be a problem when it is considered in the light that there is no substitute for experience. Age may take its toll but experience increases with longevity.

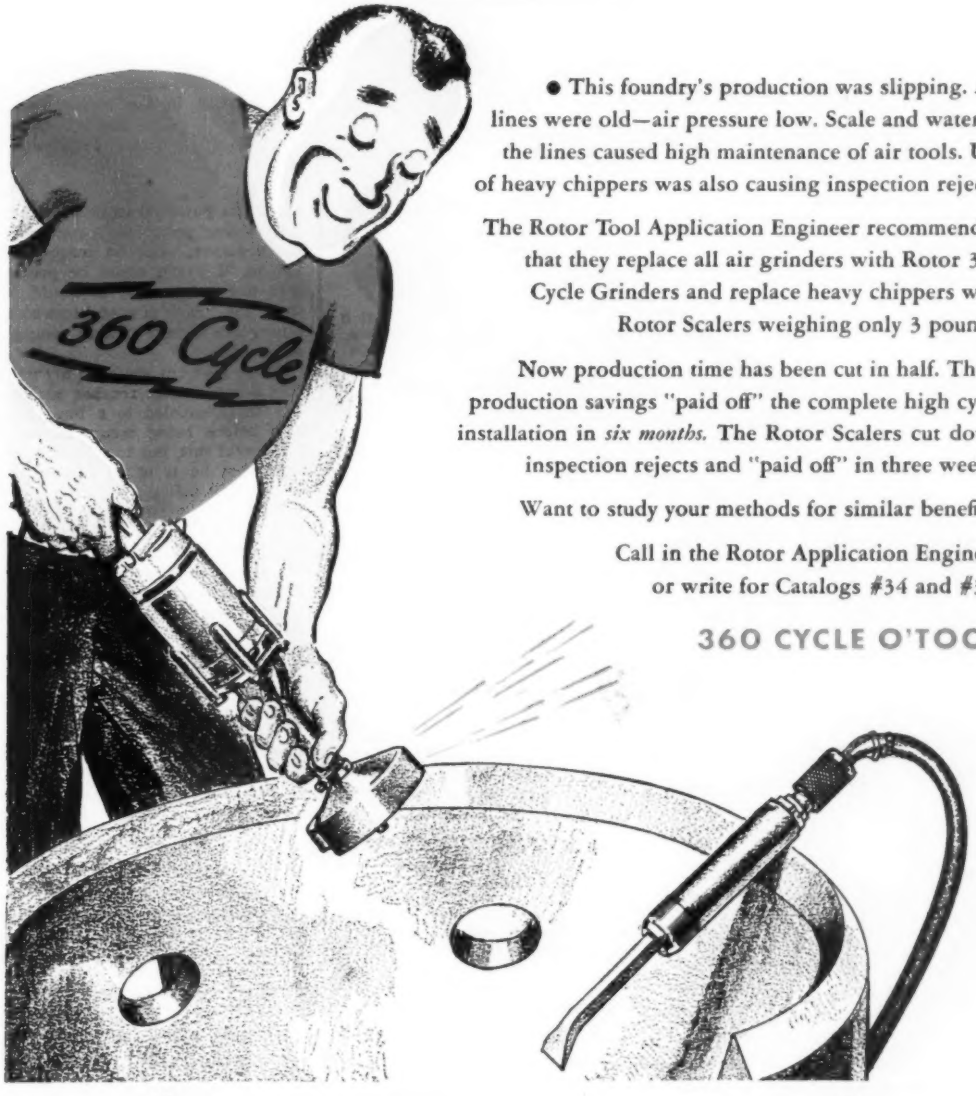
Management recognizes the need for younger men in business and industry, and also realizes that the rapidity with which these younger men reach the actual productive stage is due entirely to the character and ability of the older men who train them.

Objective studies show older workers produce at about the same rate as younger workers, they have far less absenteeism and fewer work injuries. Nor is it true that older workers cannot be retrained for new operations. Many industrial programs during the last war demonstrated that with careful, selective placement and with simple changing of engineering design, many of the jobs formerly assigned to younger workers could successfully be performed by oldsters. There is little doubt that industry will be retaining and hiring increasing numbers of older workers. If they place such workers carefully, matching the physical capacities of the individual against the physical demands of the

"Yes, Jones, you're terrific. Now let's use that gear shaper for what it's intended."

CASTINGS CLEANED IN ½ THE TIME

ROTOR TOOLS "PAID OFF" IN 6 MONTHS!



● This foundry's production was slipping. Air lines were old—air pressure low. Scale and water in the lines caused high maintenance of air tools. Use of heavy chippers was also causing inspection rejects.

The Rotor Tool Application Engineer recommended that they replace all air grinders with Rotor 360 Cycle Grinders and replace heavy chippers with Rotor Scalers weighing only 3 pounds.

Now production time has been cut in half. These production savings "paid off" the complete high cycle installation in *six months.* The Rotor Scalers cut down inspection rejects and "paid off" in three weeks.

Want to study your methods for similar benefits?

Call in the Rotor Application Engineer or write for Catalogs #34 and #37.

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PRESS-RITE POWER PRESSES are now available in all models with reasonably prompt deliveries. Future material shortages may affect delivery schedules. Order now and have PRESS-RITE PRESSES in your plant for top production and lower operating costs. Take advantage of such PRESS-RITE features as Non-Repeat Single Stroke Safety Mechanism, Automatic Cam Actuated Brake, Greater Shut Height, and Triple Ramway Lubrication.

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job, they will find the older worker fully able to carry his share of the load.

Retention of the older employee is one way of meeting the implications of the steady increase of older persons in our population. Industry should evaluate the potentialities of older persons in its employ to insure their continued useful and satisfying participation in the company.

Harry Kaufman
Philadelphia

•

IF ALL the potential value wasted by the asinine policy of "pasturizing" an employee, after he reaches the age of 65 years, could be pressed into one solid mass, it would reduce the stock pile of atom-bomb power too a mere puff in comparison.

There isn't any doubt in my mind that when a man reaches such an age he is entitled to a few years' rest before being measured for a horizontal suit, but to take the attitude that he is of no further use is carrying policy too far.

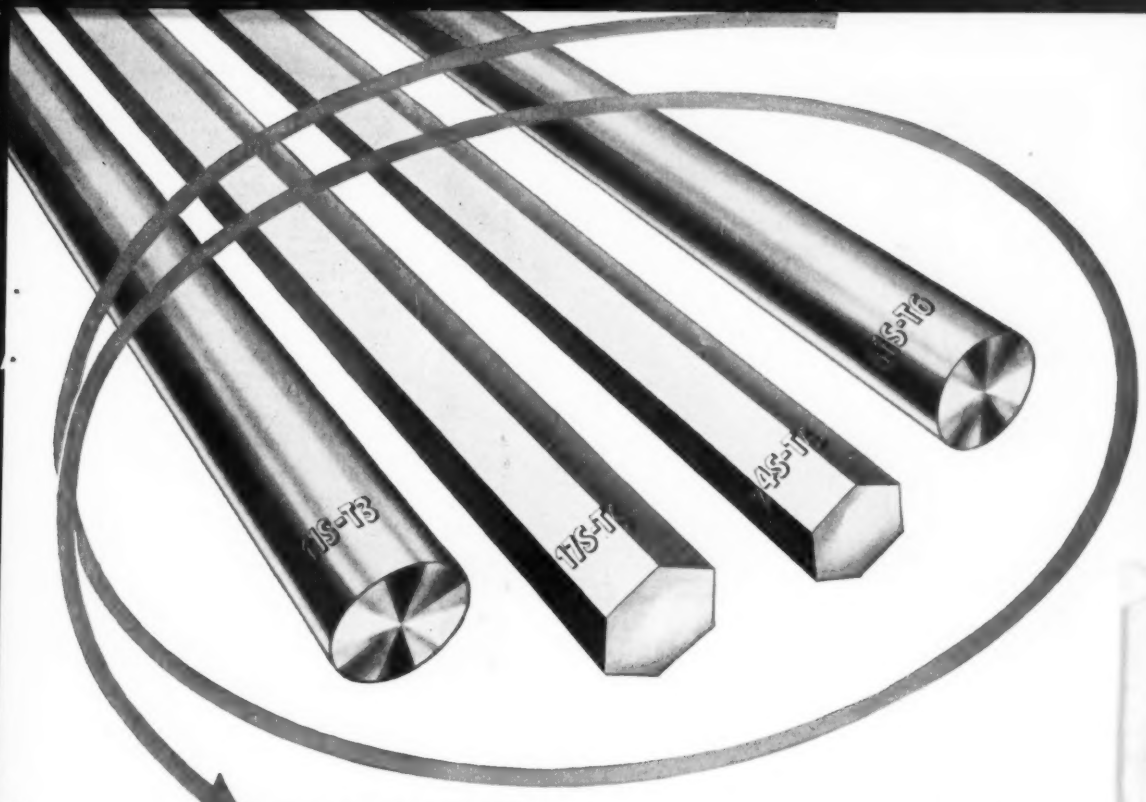
What usually happens to the "pasture"? Usually he gets accustomed to his easy chair and immediately the forces of nature get after him. Either his left kidney strips a thread or his hydraulic engine begins to chug with alarming irregularity simply because nature intended that he should carry on.

I'm convinced that Harrison, the employee under discussion, may have lengthened his lunch-box-carrying arm to an alarming degree but what does a couple of uneven arms amount to in comparison with a highly developed brain? To let him go down the chute with the rest of the scrap is economically unsound and decidedly idiotic.

Right here in my own town there is a works manager, of an appliance plant, putting in his last year because he has reached the "age of retirement." I have seen this plant grow up from a manufacturing scrap pile into one of the most efficient production units in the country. Just because of the company policy of letting the employee go at the terminal age a good man will be shunted aside.

To me an employee should be considered in proportion to his active value—regardless of his age. What if he does reach ninety so long as he has the necessary mental and physical kick—why be wasteful?

In the field of education, particularly, the instructor grows in wisdom with years. But "No!" say the policy nit-wits— "let's scrap him



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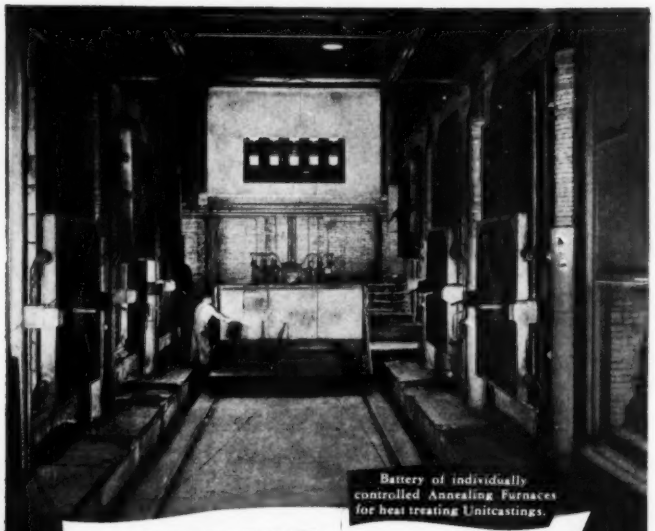

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In heat treating, Unitcastings are grouped according to the grade of metal and thickness of cross section to assure meeting all physical requirements. And all Unitcastings are heat treated in this manner to insure better performance. Here's just one illustration of the many ways Unitcast's adequate plant facilities benefit you.

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UNITCASTINGS ARE FOUNDRY ENGINEERED

and take on a young squirt who doesn't know a damn thing in comparison." Harrison, and all in his class, should be retained—unless, obviously, it so happens that he show signs of senescence—and the accumulation of years of valuable knowledge be utilized to their maximum by passing on to the younger generation.

We aim for stability in our economic structure and it is the old head who is the stabilizing influence. Let Harrison's masterful touch gain their confidence and be influential in pointing out the dangerous pitfalls that constantly fascinate them. The 65 policy is only playing into the hands of the hind-tit group who are reducing our financial milk level by effortless draughts.

J. Homewood
Ontario, Calif.

•

NO PREDETERMINED age can be found that will determine at what time in life all workmen should be retired.

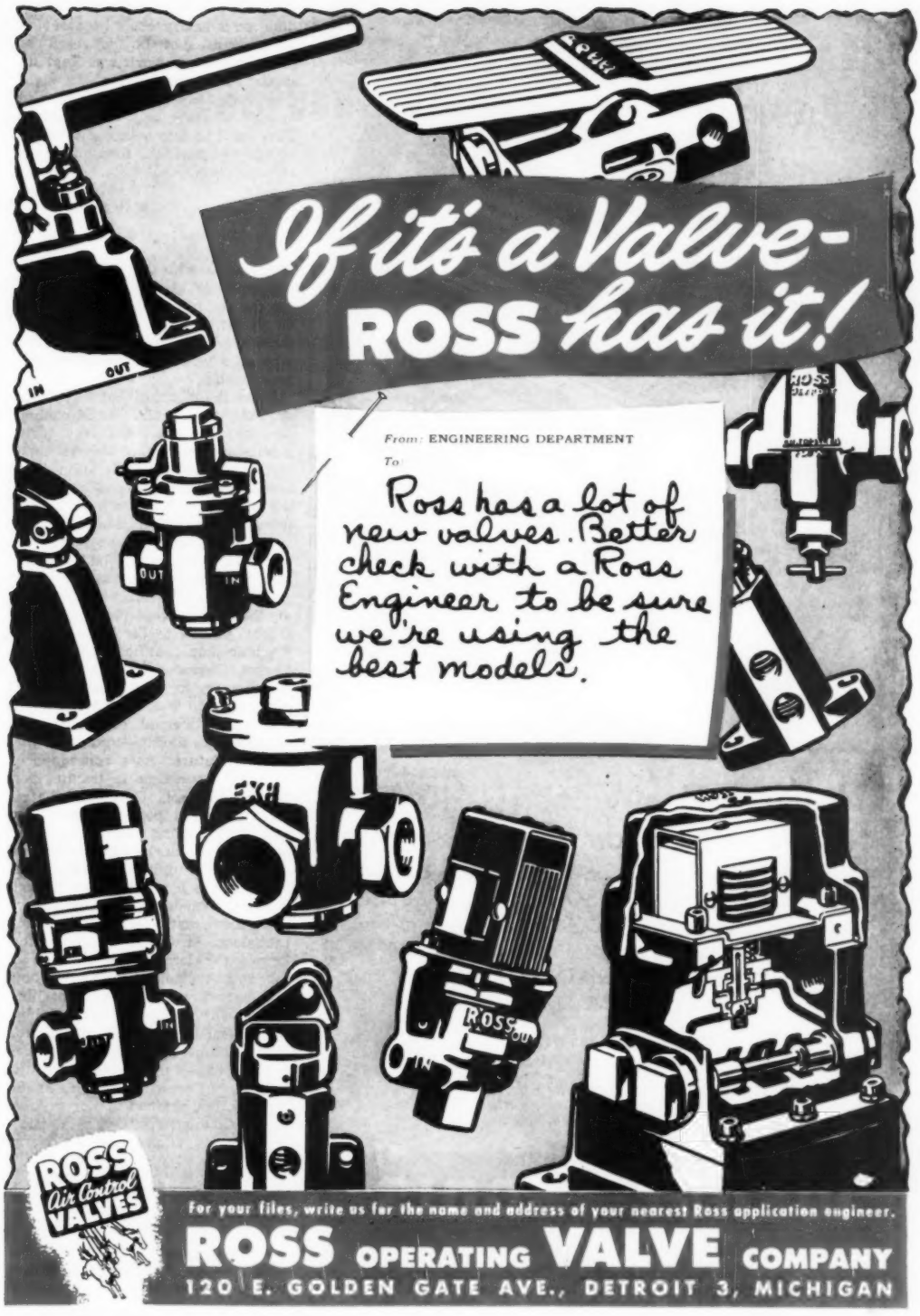
When a young man is put to work and shows progress in a reasonable time, he is kept in employment. On the other hand, if he does not make a reasonable showing, he is not kept long.

Now why should not a person who makes a satisfactory showing for his employer be kept on the job regardless of his age if he is physically able to continue on? Of course there are many who have no desire to work after they become eligible to receive enough money through Social Security, pension, or insurance to meet their necessary expenses; however there are those who have no contentment of mind except they have some work to occupy their time.

Therefore it would seem to me that it is best for both employer and employee not to retire people as long as work for the firm can be done satisfactorily to all concerned.

A change of work may be desired, hours of work might be changed, and salary adjusted to meet the changed conditions, but with contentment of both employer and employee maintained.

I happen to know of one instance where following a quite lengthy illness on the part of an employee and due to rules of the company and laws of the state the employee could not return because of his physical condition. This former employee did arrange with the employers to do the same work as he had previouslv done at his home, at contract prices with the understanding that the contracts were given at about one half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ROLLER TURNING TOOLS • SPECIAL BITS

the price as when the work had been done on a salary basis because the work could not be delivered as promptly. Such work was kept up under such a plan for about eight years satisfactorily to all concerned and by so doing kept the employee busy until he was over eighty years of age and until the firm no longer required him.

Abel Blakeman
Watervliet, N. Y.

•

WHAT to do with the employee who happens to be, chronologically, ready for the torch? Why and wherefore 65 years? This is another one of those indeterminate ponderables like why four years is required for apprenticeship.

From the mythical hat let us feel around among the metal-busting terminal candidates and draw forth a prize winner, such as Michael Gobbledegook, for consideration and break him down to the determining elements just as we do in our job-analysis in educational work.

Gobbledegook — Gobby, as his lard-oil-and-chips pals had dubbed him, managed to finish his high-school training in four years (there's another one—why four years?). Gobby proved to his instructor, in machine shop, that he possessed that unusual intuitive mechanical sense so necessary for one to succeed as a high-powered metal buster.

The lad seemed endowed with another rare ability—that of seeing into the future. As a consequence, he spent some time in training for the field of art. Gobby vacillated from pillar to post for about six months following his proud strut across the auditorium stage and was about to give up in disgust and take a job at the P and P Food Market when Gobbledegook senior pulled some Democratic strings at the local saloon. It was about six months before the tomato ripened into a job at the steel plant and Gobby was started on his way as a machinist apprentice. By the time Gobby had finished his period of training (four baffling years) he had become a dependable family man with a little Gobby crawling over his knees after he had washed up for supper. Mike Gobbledegook was a good worker and stayed put for many years until the forces of "evil" showed up to slow him down.

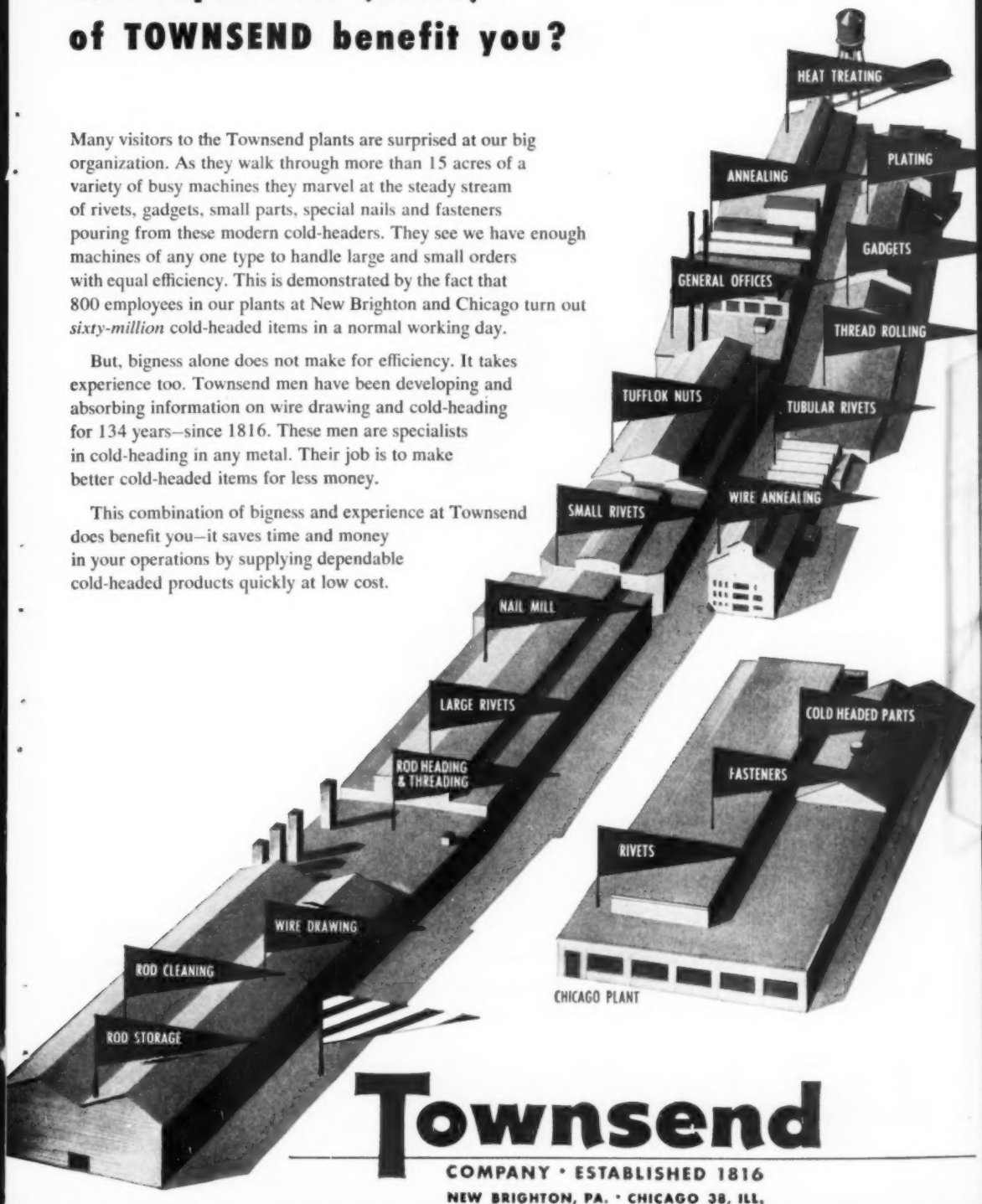
Gobby didn't waste any of his idle time in reading funny books like some of his fellow machinists—he wielded the small brushes doing his "oils." When he wasn't on picket duty before the big gate at the plant

How does the size (BIG) and experience (LONG) of TOWNSEND benefit you?

Many visitors to the Townsend plants are surprised at our big organization. As they walk through more than 15 acres of a variety of busy machines they marvel at the steady stream of rivets, gadgets, small parts, special nails and fasteners pouring from these modern cold-headers. They see we have enough machines of any one type to handle large and small orders with equal efficiency. This is demonstrated by the fact that 800 employees in our plants at New Brighton and Chicago turn out *sixty-million* cold-headed items in a normal working day.

But, bigness alone does not make for efficiency. It takes experience too. Townsend men have been developing and absorbing information on wire drawing and cold-heading for 134 years—since 1816. These men are specialists in cold-heading in any metal. Their job is to make better cold-headed items for less money.

This combination of bigness and experience at Townsend does benefit you—it saves time and money in your operations by supplying dependable cold-headed products quickly at low cost.



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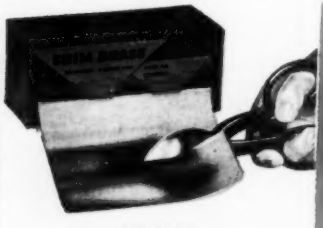
Ready for instant use without fumbling or waste

Packaged shim stock means *convenience!* No clumsy handling or spoilage of large bulky sheets or rolls. In our dispensing cartons and packets the stock is always protected, yet always available for immediate use. Just pull the length you need out of the carton slot—and snip it off. Saves time, saves space!

There's a handy carton, packet or rack designed for your requirements by the makers of the famous LAMINUM Shims



RUGGED CARTON DISPENSERS

6 x 100 inch rolls in metal-edged cartons. Stock feeds through carton slot, as required. No re-rolling, no ruined stock. Available in 11 gauges: .001, .0015, .002, .003, .004, .005, .006, .007, .008, .009 and .010 inch.

STURDY FLAT PACKETS

Two 6 x 25 inch sheets to the envelope. The heavier gauges—which do not roll easily—are supplied in special protecting flat packets: .012, .015, .020, .025 and .032 inch.

THE 4-GAUGE ECONOMY CARTON

Four 6 x 50 inch rolls in one carton. The utility unit, containing the four most popular gauges: .001, .002, .003 and .005 inch. The same first quality brass or steel shim stock.

THE METAL DISPENSING RACK

Holds the four gauges of your choice. Pick the four gauges you use the most. Rack is designed to hold the 6 x 100 inch carton dispensers. Sets on bench or hangs on wall.

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SHIM STOCK

STAMPINGS CUSTOM SHIMS AN-COR-LOX NUTS

he exercised the cravings of the soul.

By the time Gobby was 55 he had worked—oh, let's say, roughly, about 17,000 hours—based on 37 years on the job. During the past ten years Gobby lost many months from strikes, jurisdictional disputes, coal shortages, railroad tieups, industrial ennui, and so forth.

So, not to be outdone with conditions not of his own making, Gobby put on canvas enough paint to cover the Empire State building three times over during his spare time. Let's not digress too much on Gobby's artistic accomplishments and get on with the essentials— production hours at the Saggy Bottom Crankcase Company. Gobby carried on with customary irregularity at the plant and by the time he reached the age of 65 years, his own bottom was sagging. Poor Gobby was so bewildered between his soul-building daubs and nerve-wracking shuttlings between picket labors and shaper reciprocations that he finally collapsed on the job. In a few days he was called into the office and given a Helluva, 17-jewel watch in appreciation for his faithful service, and in addition, was told that he could help himself to all the paint he needed for his pastels. Could it be that Gobby's experience had something to do with the solution of the problem of why 65 years?

Jack Everett
San Francisco

•

THERE was one very astute business executive who said, "Young men for trades, old men for professions," and, as Harrison is to become a teacher, he is entering one of the professions.

This businessman began granting pensions nearly 50 years ago, and an elderly employee could live and take his pension or he could stay and work a part or all of a day according as to how he felt.

About 20 years ago, in the largest plant of its kind, a visitor saw a man 82 years of age doing art work.

As the visitor noticed that he was bent nearly double, and working with a magnifying glass, he inquired as to his age and if he were a foreigner, also if they worked all their men until that age.

The manager, who was acting as conductor, replied that there was not a foreigner in the plant; that there are just as good or better men in America as anywhere in the world and who could do just as good and fine work as we can ask; that the old man came to the plant

HERE'S A *NEW IDEA* IN ELECTRIC-DRIVEN AIR COMPRESSORS

that means lower costs of Installation, Operation and Maintenance

- *Pipeless, thru-frame air flow*
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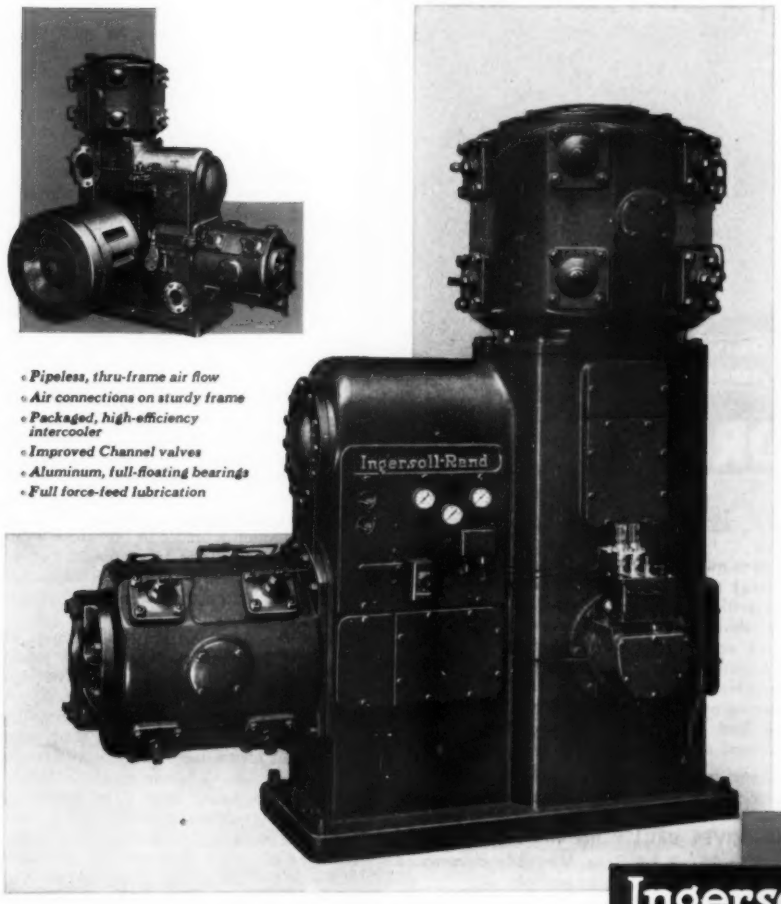

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The XLE incorporates a "new look" and a new idea in air-compressor design. It is a heavy-duty, well-balanced, easy-to-keep-clean machine that can be installed with an absolute minimum of effort, time, and cost . . . on a minimum of foundation.

Simplicity of **XLE** construction, and advanced-design features such as aluminum-alloy full-floating bearings that require no adjustments in a sealed, dust-tight crankcase, result in lower-cost maintenance and a higher degree of dependability.

The XLE is a highly efficient compressor built for continuous, full-load operation, and is ideal for factories, railroad shops, mines, powerhouses, and large construction jobs. It is particularly suitable wherever skid-mounting, factory floor, or ground conditions require a well-balanced machine.

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In 1951 your tool room must be prepared for all-out production—equip it to meet any emergency! An installation of Oliver Drill Pointers will save time and money. Oliver Drill Pointers produce a theoretically perfect drillpoint that is always uniform—has equal lips—with the correct amount of clearance for the metal being drilled. Oliver ground drills last longer between grinds—they require less feeding pressure and horsepower to operate. Your drilling machines will produce more work and better work in less time. Savings will soon pay the initial cost of an installation.

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nearly every day and worked one or more hours as he wished; that when he would finally leave for good, they would never be able to replace him.

Further, the manager said that the young man working next to him was an expert, but "he would never be as good as the old man."

Many men, among them wealthy ones, work practically to their dying day.

Now, as to Harrison; he may be well along in years; he may be a bit slow but he may also be "young for his years" and may have just the talents necessary to be a leader, an instructor and a balance wheel which will prevent boys from showing too much exuberance.

Poise, he may have it to the extent that boys will respect him and not be too damned smart. Also, he may have the faculty to impart his knowledge to others, which, in itself, is a prime requisite for instructors to have.

F. H. Stebbins
Worcester, N. Y.

•

WHEN WE consider the problem of retirement, should we not look into several other factors? The condition surrounding the man's health, his mental alertness, his need for financial aid to supplement the pension and above all, his well-being if he is suddenly placed in the world without any duties to perform. Let us think over a few of these important points to be considered in any case of retirement.

When a man reaches 65 years of age, is he as healthy as he was when he was younger? Does he have days when, because of normal conditions, it would be better that he took life easy for that day? We might say why wait for 65, for many men reach this stage in life much earlier. Human nature, being what it is, makes all people different. Some of us are old at 50 while others are still active at 80 years. Perhaps the age limit is not the guide. This, however, is a problem for individual companies and individual employees.

Does your employee need the additional income gained through working when he reaches 65? As our trend toward high pensions continues, there will come a day when no man will need other than his pension if he has been at all prudent during his lifetime. Let us not argue this on the grounds of whether he should have a large pension or not, but let us face the fact that he probably will. Then only those people, who through some ill for-

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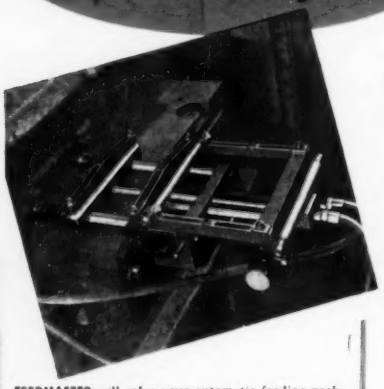

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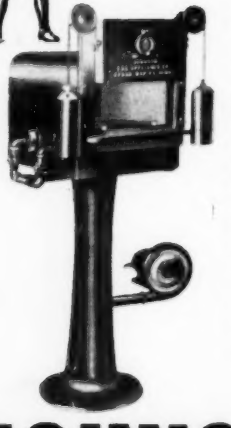

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FURNACES FOR INDUSTRY

tune can not live on the pension, need be considered. This group will be small and industry can take care of them.

What will happen if we release our employee at 65? Will he suddenly break down and become a burden on society? Will he, because of his active nature, find other outlets for his activity and be able to readjust himself to his leisure time?

A few of our industrial leaders have given a glance and have spoken regarding the problem. Create a research department for old timers. Let them putter around. It will help keep them occupied and out of our hair. That is not much of an answer to our evergrowing problem.

Should we not face the problem squarely and study all aspects? Should we not attempt to develop work which, if a retired employee desires to enter into it after 65, he can do so? Don't we have many minor civic jobs that men over 65 can easily hold? Should we not consider such ideas as partial solutions to our problem?

Should we set up training programs using the older men to guide the younger fellows? Perhaps. Many problems can arise from this. Some old-timers do not believe in new ideas. These men would hinder our industrial growth. A lot can be learned from these older men if carefully screened and properly seeded. It may be one place where our retired worker can help provided only those who keep an open mind are allowed to enter into the program of training our younger labor.

Someone must start this overall study of "out to pasture." Why not industry? Why let the Government

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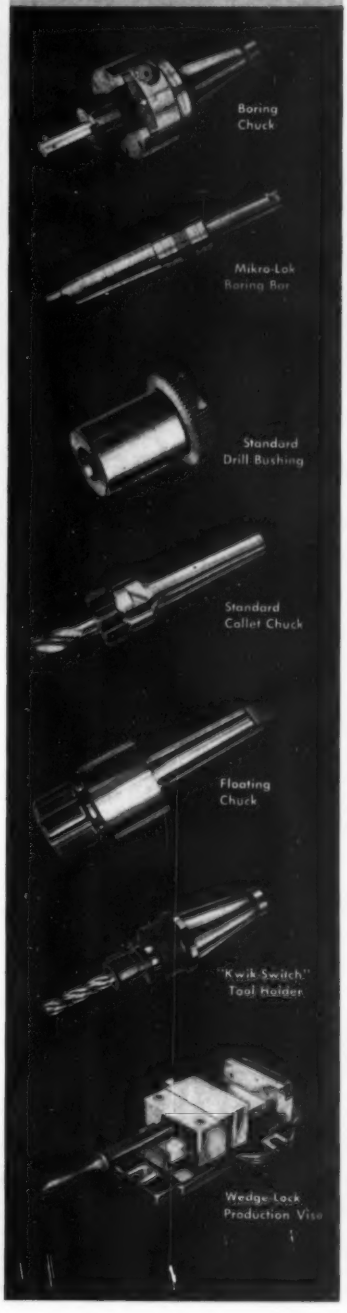

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or the unions take on the project? Remember that if they do, it certainly will not favor business as a whole. Let us all forget our industrial squabbles among ourselves and go to work on some of these pressing problems. If we don't we will no longer have free enterprise.

Charles D. Townsend
West Hartford, Conn.

•

ONE OF our men went to an optometrist to have his eyes examined. The optometrist, after asking the man's age, insisted that because he was over 40 he should have bifocals. The examination proved otherwise. The man is near 50 and still needs no bifocals. On the other hand, I know of individuals under 40 who do need and use bifocals.

This is not an extreme case. We all know of cases where an older man will do more physical work with less fatigue than younger men and vice versa—which just goes to prove that "we can't almost always sometimes tell" what age means to a man.

There is room in modern industry for men of most any age—and that is most certainly not in competition between age and youth.

Anyone who is given the responsibility of getting work done efficiently realizes that it requires skill to direct the activities of men regardless of age. Just as we use skill in directing the energy of various voltages of electricity—so should we use skill and ingenuity in assigning work to be done by men of different ages.

The efficient use of manpower requires the skillful use of men in all age groups. The responsibility for the efficient use of manpower rests with management and supervision. The responsibility is not light—it requires skill in human engineering and an open mind.

Henry George
Dayton, Ohio

•

MANY men over 65 can hold their own with the youngsters only half their age. The oldster may be a trifle slower than the fellow in the 20- to 30-year bracket, but when working with familiar tools and materials the older employee has some advantages over his junior sidekick. Although slower, he will produce as much in the long run. In most cases his pride in work and craftsmanship are of higher caliber. In my experience I find the older employee has more self-control.

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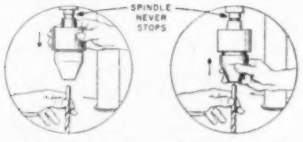
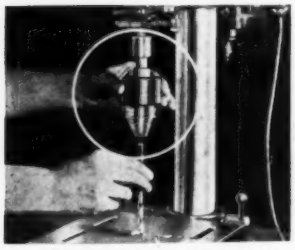
Change drills in a second, safely, with this Automatic Chuck while spindle is running

HERE'S ALL THERE IS TO CHANGING DRILLS



1. Grip sleeve—pull down —jaws open automatically —drill is released.

2. Insert new drill—push up tapered part—drill is locked in place.



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You don't stop the machine to change drills with the AMF WAHLSTROM CHUCK. No keys, collets or wrenches are needed.

That's why Wahlstrom Chucks cut costly minutes in changing tools for drill press work or for spotting, drilling and reaming in boring or milling machines. They'll also save money in lathe work for burring, turning, filing, etc. *One spindle does the work of several.*

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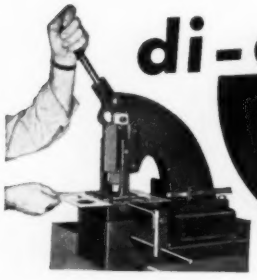

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of men in their sixties. Certainly industry needs their clear thinking and sound judgment. In my opinion we need these older men for apprentice training, for teaching the economic facts of life as well as training the younger employee in the individual roles. We also need the older employee in training safety, quality, production and the fundamental good principles of human relationship. Many of our older men are the most brilliant.

Don't put the older employees on the shelf or out to pasture. Business will lose more than it gains if we do. We not only need these men for their skill in their particular trades or professions, but mostly for their skill in human engineering. Industry will be richer from the knowledge of the older employee.

A. E. Salmons
Philadelphia

•

SERIES BUSINESS

WHERE I served my apprenticeship, long years ago, the result of every important sporting event that took place during working hours was known a few minutes after the finish. Some crony from the saloon on the corner would come and inform the fellow in the shop through a conveniently opened window. Also there was always betting; and in every shop a lottery, winner take all, on the results. Of course this was supposed to be done under cover, but practically everybody joined in and there were arguments pro and con, just like today, as to who would win or lose. Someone used to buy several tickets, for the top brass, of course, but on the strict Q.T.

There is another point. The posting of the scores in the shop of any important ball game during working hours would certainly curtail absenteeism on that day.

Of course there will be an occasional error that means a scrap job that could be laid directly to the putting up of baseball scores. Just as some young man gets to daydreaming about the blonde he was with last night, thinking of her beautiful blue eyes, the prospect of having her all to himself someday, to keep her clothed and fed for the rest of his life—and suddenly comes down to earth to find that he has let his cut on the shaft he is turning run ½ in. beyond the shoulder length. There has been far more spoiled work due directly to the young man's thoughts being with that female that he was with last night. He is in a daze, not all there so to speak. That is partly why Mon-

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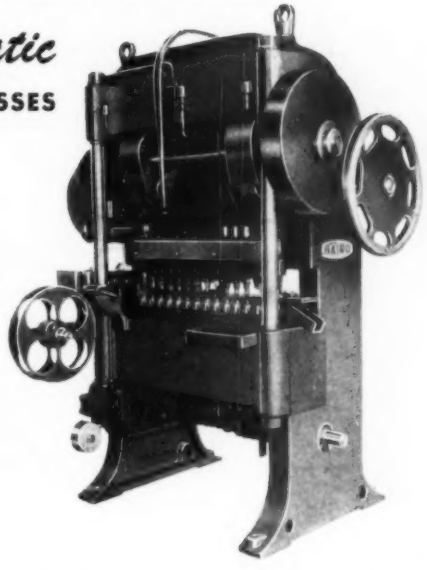

Simply stated, this press combines, in a single cycle, operations that might otherwise require several smaller machines with an operator for each one.

There are so many varied tooling possibilities that it is impossible to enumerate them here. In ordinary operations the press automatically feeds coil stock for piercing, lettering, embossing, etc., then cuts the blank, places it in transfer fingers, moves it along to several other tool stations and ejects the finished piece. In addition, preformed material may be fed from the opposite end of press for many other operations . . . all completely automatic. A full set of tools (composed of punch and die blocks, their punches and dies, transfer slide and fingers) may be removed as a single unit . . . and a different set inserted, and in some instances without disturbing any adjustment . . . in a comparatively short time. Note the following example:

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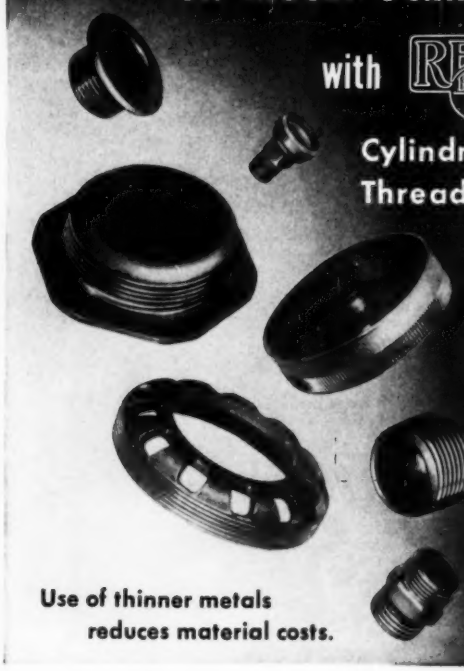

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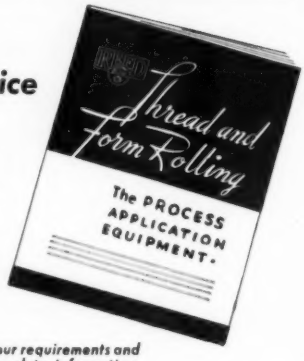

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AM-087

day is called Blue Monday—there is always less work done and more errors made on that day.

It won't be too long, Ed, before television will be brought right into the shop, where the game can actually be seen, the price of admission being probably extra effort, a certain quota on production. (The first prize the first half of the ball game, second prize, second half of the game.) There are at least two top officials of one company who have television sets in their office and that there is no doubt in my mind that sooner or later the television concerns will find a way to put it to work inside most every plant.

Arthur Sylvester
Niantic, Conn.

•

"OVER HIS HEAD"

BIG PROBLEMS or grievances develop when foremen do not take care of little irritations. If the little complaints were taken care of promptly and properly, fewer big problems would arise, and foremen would find themselves less frequently "short-circuited" by workers going directly to the superintendent.

The key point is to find out what is really going wrong; that done, the foreman should take immediate steps to remove the source of irritation. There will be no occasion for a worker "going upstairs" first when a human problem situation arises if the leadership of the foreman is functioning as it should.

An alert foreman can usually spot a potential trouble source through knowing his worker, his work, how he performs on the job and what he is thinking. He should take necessary corrective action that will discourage "short-circuiting" tendencies on the part of the affected worker. Prevention is the proper approach to grievances.

Of course, no foreman wants only mechanical obedience to rules and regulations from his men. This leads to failure to act except on explicit instructions and decisions from a superior, a course of action which will overload the superior and lead to excuse-making and irresponsibility in the subordinate. The worker who possesses or wishes to develop the traits of initiative, decisiveness, ingenuity, and resourcefulness goes ahead on his own whenever possible, keeping his immediate superior informed but not heckled, and makes sensible suggestions for improvements in method of these, upon careful analysis, appear to be feasible. It is an indication of lack of cooperation between the foreman as a super-

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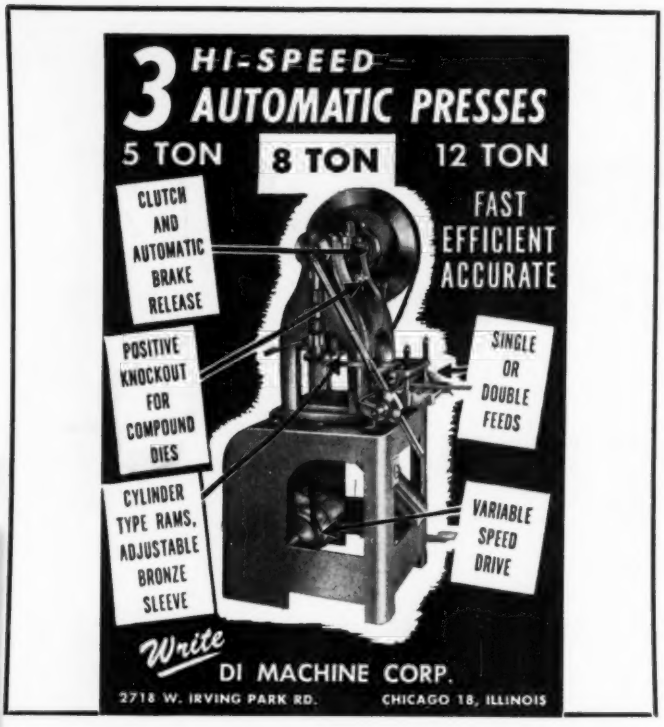

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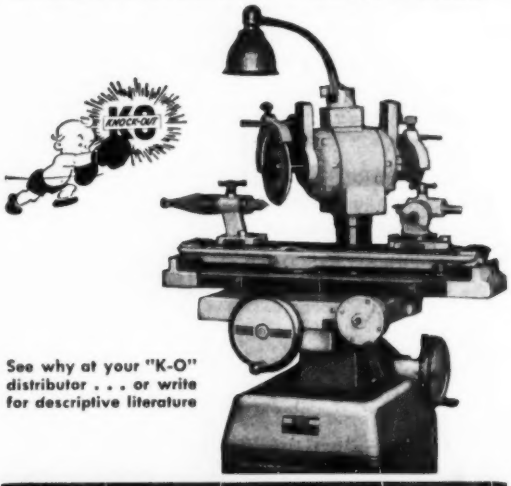

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visor and his worker when the latter feels that "going upstairs" first is the only course open to him to effect corrective action.

The superintendent should certainly discourage such bypassing procedure on the part of the worker and instruct the man to take up matters of this nature with his foreman in the future. Of course it is without question that the worker should have the right of appeal from his superior's decision to a higher level when he considers the decision unfair. But going directly to the superintendent with a problem is a "horse of another color."

When a worker goes over his foreman's head, it usually implies a lack of faith in his foreman's judgment and ability to correct a troublesome condition. The man did not give his superior credit for possession of sufficient initiative and resourcefulness to solve the problem. He also failed to take into account the foreman's consideration for the welfare of the superintendent who certainly should not be worried with minor details of a problem strictly the foreman's "pigeon."

Regardless of the kind of business, a settled organization with proper delegation of responsibilities and authorities must be planned in advance, adopted, and followed, if successful operation of the company is to be achieved. This planned organizational or company policy will result in harmonizing the functions of the business; it will be the main highway along which the business travels. By following through on designation of authority, orderliness will be achieved, and each part of the organization will operate efficiently both withing itself and in relation to the whole. All parts will so operate that the total picture of operation is one of overall unity, and not the separate and independent operation of a conglomeration of parts. The physical operations of the business man than proceed with maximum efficiency and minimum confusion.

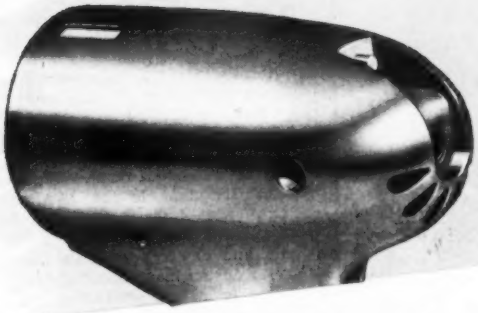
Harry Kaufman
Philadelphia

•

FIRE OR FIZZLE?

THE QUESTION of whether it is right to fire a man and, before he gets out of the door, to rehire him, can be looked at in two or three ways.

In the first case let us consider why the man was fired. We see that Ed states the man was let out for insubordination — quite a charge. What was the cause back of it? Was



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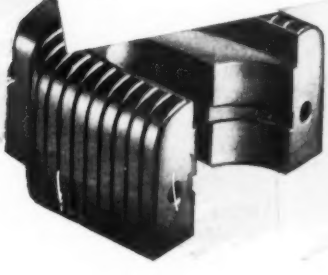

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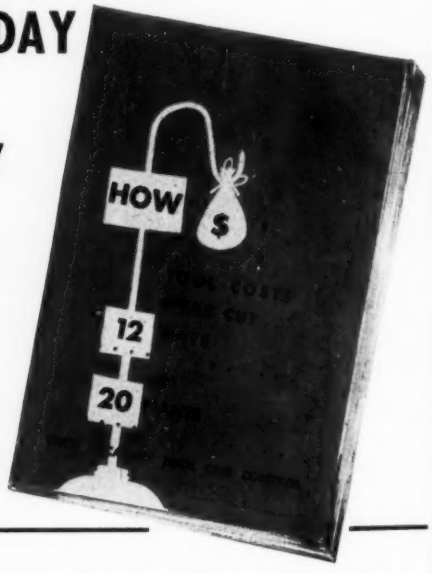

"How Tool Costs Were Cut 12 Ways in 20 Plants" . . .

How savings start the day McCaskey Tool Crib Control is installed in a tool crib is told in the words of responsible plant executives. Here is a report of results in twenty representative plants and how they were secured, abbreviated to save your reading time.

For example, reduced purchases resulting from shrinking crib inventories and prevention of hoarding usually pay the McCaskey bill several times over. A dozen other immediate savings add up to substantially lower tool expense and improved operating efficiency.

Let us send you the booklet telling how McCaskey can help cut your tool costs, too.

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it a clash of personalities? It could have been. Perhaps Ed is not a leader of men—maybe he cannot handle his workers and thereby causes friction. If we find that the foreman was as much to blame as the worker or perhaps more so, then the shifting of the employee to another department is a wise move. However, should the worker be at fault and someone who cannot get along even with himself, he should have been let out.

Frequently problems of this type are avoided by having a personnel department that is on its toes. Before the clash occurs the man has been transferred to some other job in some other part of the plant. Naturally this cannot always happen, so we have cases like the one we are now considering.

The fact that the man receives his walking notice and is then rehired does have its effect on the efficiency of the foreman. He does lose some "face" with himself and with his men. However, it certainly doesn't help him to get burned up and to try to do the man "dirt." This only shows up the foreman's temperament and makes one wonder if perhaps he wasn't more to blame than the worker.

In these ticklish cases it would be much better if the foreman would enlist the help of the personnel department in working out his problem. It would save some embarrassment on his part and would certainly make for smoother operation within the company. It is true that good workers are hard to get. Also workers who have been with the company a period of time are worth saving if possible. They have cost money to train and to get an advantage from them, the company must keep them on the payroll if at all possible.

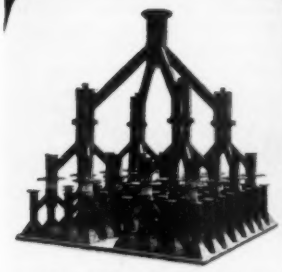
So what we should say is that in cases where men are not working out satisfactorily within a department the foreman should discuss the problem with the personnel department and arrange for the man's transfer. If when all attempts have failed to save the employee, the personnel department will not feel he must be retained. His record will indicate his faults. He will deserve his dismissal from the company.

Charles D. Townsend
West Hartford, Conn.

•

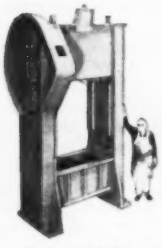
NO MAN who is really insubordinate should, after having been fired, be hired again to work in the same plant, because doing this will em-

Steel-Weld FABRICATION



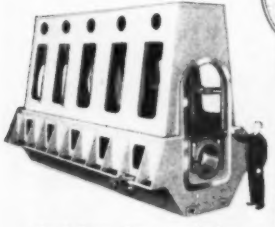
One of Several Parts of a Catalytic Cracking Plant Produced for the Petroleum Industry.

Pressure Vessels for the Chemical and Allied Industries.

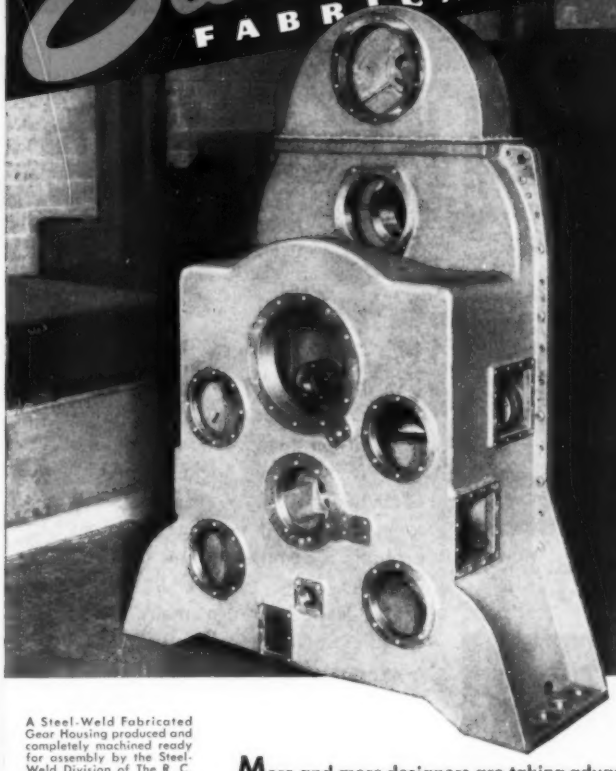


Heavy Press and Machine Frames and Bases for the Machine Tool Industry.

Diesel Engine Crank Cases and Frames for the Marine and Electro-Motive Field.



Crank Cases, Frames, and other Parts for Manufacturers of Marine Steam Engines of Uniflow or Multiple Expansion Type.



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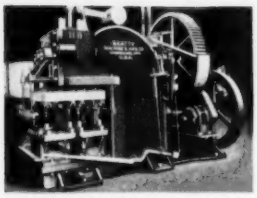
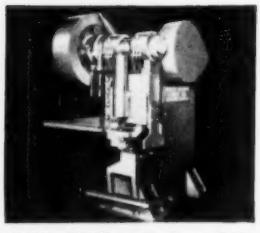
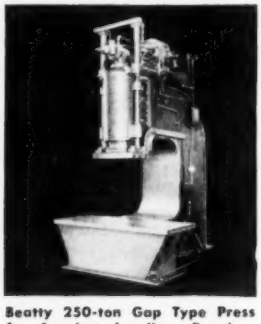


BEATTY No. 11-B Heavy Duty Punch widely used in railroad industry.

Beatty Horizontal Hydraulic Bulldozer for heavy forming, flanging, bending.



Beatty Single End Bar Shear available in capacities up to 300 ton.



Beatty 250-ton Gap Type Press for forming, bending, flanging, pressing.

YOU NAME the problem

WE'LL BUILD the answer

If you have a heavy metal working problem, the odds are that a BEATTY engineer can provide the answer. That's true because BEATTY engineers have designed and built so many special machines that no problem is completely new to them.

Our experience in many fields qualifies us to design and builc heavy metal working tools that will speed your production, reduce your fabricating costs. There is a bette. way to handle most production problems, and our specialty is to help you find that better way.

bolden others who might have tendencies toward declaring their independence of authority. This of course leaves out the question whether Potts was really insubordinate. In any case the best that can be said for the action of the personnel department in this particular case is that it is clumsy, psychologically, and certainly is no contribution to sound plant morale.

So-called evaluation interviews definitely save good workers for other departments of a plant, if and when they are made at the proper time and in the right way. After a man has actually been discharged is definitely the wrong time. If management does not see fit to let the word of foremen be final in firing, then all discharging of men should be done on a qualified basis. Then, instead of firing a man outright, the foreman would notify personnel that a given man must be removed from his department. It would be required of the foreman in every such case that he keep the matter confidential until personnel had first had its "evaluation interview" with the man. Then it would be up to personnel either to issue a discharge for the man, or to place him in a different department, and to assume responsibility for his placement.

In this, as in other problems having to do with human relations, we come inevitably to the fact that there will be wide variance in ideal courses of procedure with different men.

Ed's idea of tipping off Ben, marks him as a man who is not completely mature emotionally, and puts him under suspicion as one who might "seek out many inventions" to get

"Well, did I pass?"

Model 5A

ROCKFORD HYDRAULIC SLOTTER

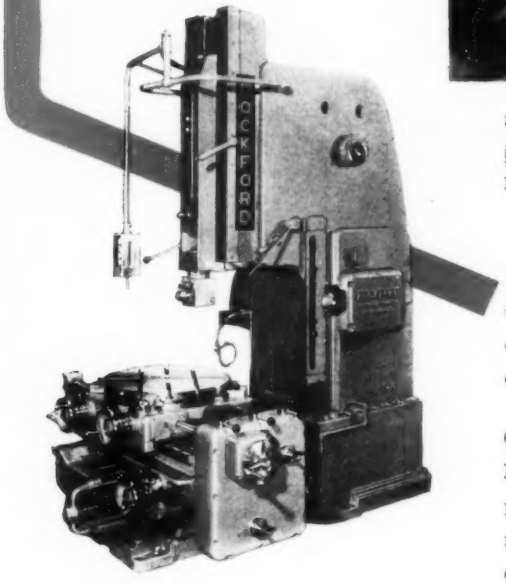
CUTS SLOTTING TIME FROM 3 HOURS TO 55 MINUTES

GISHOLT MACHINE COMPANY says:

"We formerly worked the slot from each end of the piece. Cutting time was 3 hours."

"We are now doing the same job with one set-up in only 55 minutes."

Single operation shapes internal keyway 1.250" wide ±.005", 11/16" deep and 16" long. Total cutting time is 55 minutes, a saving of 125 minutes over former time. Work piece is cast iron Pedestal Carriage for Gisholt Dynamic Balancing Machine.



20" stroke Rockford Hydraulic Slotter, complete with Rockford Slotter Vise and Angle Plate, cuts slot at 40 feet per minute with .004" feed per stroke. Previous method required 3 hours and two cuts, one from each end of the keyway.

● Large irregular pieces, internal surfaces, angular or rotary cuts — all are handled with ease on new SA Hydraulic Rockford Slotters.

Cutting speeds are selected from the pendant. Hydraulic cross, circular and longitudinal feeds provide flexibility. Many other improved engineering features offer you new production short cuts for slotting work.

Ask a Rockford representative to show you these advantages. Send for a copy of Bulletin 601A.

Hy-Draulic

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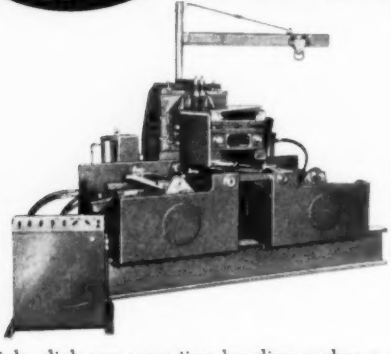
ROCKFORD MACHINE TOOL CO.
2500 KISHWAUKEE STREET ROCKFORD, ILLINOIS

Your *dryer* competes on appearance too!

Give it *one-piece beauty* and save in fabrication with the

Struthers Wells TANGENT BENDER



Quick, slick one-operation bending makes a wrap-around *for less* . . . when the Struthers Wells Tangent Bender goes to work for you!

You can design top-flight, streamlined beauty into your dryers and other appliances without a cost penalty in production, because the Tangent Bender handles radial edge bends of flanges, corner bends of any radius, and crowns, *fast and easily with less handling.*

Let us meet for a factual discussion!

STRUTHERS WELLS *Corporation*

***Machinery Division:* TITUSVILLE, PENNA.**

rid of a man who was not obsequious in a great enough degree to bolster his ego. It might be well for personnel to make a check, for instance, as to how many cases of "insubordination and general inefficiency" Ed has had among his men through the years, as against similar records of foremen in other departments. There are many men who are good mechanics and entirely reasonable in their human relations, who would nevertheless far rather be fired than to play up to a foreman, or fawn upon him for favors. It is unfortunate indeed for plant morale when a man subconsciously requiring such an attitude has been elevated to a foremanship, but it sometimes happens.

Whether personnel was right or wrong in this case, Ed is only putting his own weakness on display by beefing about it. He is committing the very thing of which he accuses Potts, and for which he supposedly discharged him.

John E. Hyler
Peoria, Ill.

•

I REMEMBER the time when they hired a man for a job. He had to do it and if they changed the job he had to do that job too. It did not make any difference if he was fitted for the job or not.

Now friend Ed, how long did you do supervisory work? Did you like every job that you worked on? Did you have any jobs that you did not like? Do you have any special preference to particular jobs? Is it not true that you yourself can do some jobs better than others? Then why don't you take that in consideration that we human beings are not all alike?

I had men under me that were not good as floor sweepers. I could never find them on the job and when they did sweep the shop it was a disgrace the way the floor looked. I would give a man a job on the drill-press. No good. He did not do any better. I tried to break him in on the lathe, with the same results. Finally, I put him on taking care of material and you have to see him now, he is the head of our store house. You have to fit the man to the job he likes best. Then 99 out of 100 will make good.

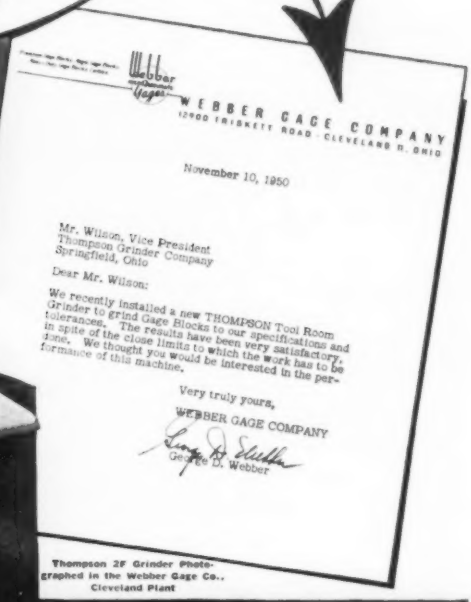
Sometimes we come up against one man who will stay up nights thinking up dodges to give you trouble. Yes, there are some like that, but if you try to find out why he does it you can remedy it. There is some bad in the best of us, and there is also some good in the worst of us. Therefore if you want to have

Here's Proof

The New Thompson Type 2F is a

SUPER PRECISION

Tool Room Grinder



WEBBER GAGE COMPANY
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November 10, 1950

Mr. Wilson, Vice President
Thompson Grinder Company
Springfield, Ohio

Dear Mr. Wilson:

We recently installed a new THOMPSON Tool Room Grinder to grind Gage Blocks to our specifications and tolerances. The results have been very satisfactory, in spite of the close limits to which the work has to be done. We thought you would be interested in the performance of this machine.

Very truly yours,

WEBBER GAGE COMPANY

George O. Webber

Thompson 2F Grinder Photographed in the Webber Gage Co., Cleveland Plant

COMPARE THIS NEW 8 x 10 x 24 TOOL ROOM GRINDER

When working to a tolerance of four millionths of an inch such as is observed when making Webber Gage Blocks, the rough or preliminary grinding plays an important role in keeping cost of the final finishing within reasonable limits.

Compare These Features:

- HARDENED AND GROUND cross slide ways completely sealed.
- One shot lubrication to cross slide ways and internal saddle bearings.
- HARDENED AND GROUND sealed anti-friction vertical slide.
- HARDENED AND GROUND BED WAYS with automatic lubrication.
- 3600/1800 R.P.M. 2 speed wheel head. Heavy alloy steel spindle heat treated, runs in super precision ball bearings accurately preloaded, lifetime lubricated.

Handy control panel.

- Elevation micrometer stop graduated in .0001".
- GROUND THREAD FEED SCREW.
- Automatic wheel TRUING device.
- Longitudinal hand wheel with automatic engagement.
- Hydraulic head movement throttle with rapid traverse.
- Hydraulic table movement throttle.
- Elevating hand wheel graduated in .0005".
- GROUND THREAD FEED SCREW.

WRITE TODAY for complete specifications and performance data. Address Dept. 10, Thompson Grinder Co., Springfield, Ohio.

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...P. R. MALLORY & COMPANY REPORTS

on Six Smith & Mills Shapers

That record, coupled with comments like: "holds very close tolerances" . . . "versatility, speed and ease of operation" . . . "quick changeability" indicates another thoroughly satisfied Smith & Mills Shaper user.

This noted Indianapolis manufacturer of electro-chemical, electro-mechanical and metallurgical products uses a battery of six Smith & Mills Patented Ram Shapers in their Welding, Contact and Special Metals Divisions. These fine machine tools operate 8 to 10 hours per day, 5 to 6 days per week, 52 weeks per year. The metal being worked is tungsten based alloys containing silver, copper and special copper alloys . . . ranges from 70 Rockwell B to 50 Rockwell C.

Cost-cutting operations like these will pay in your shop too. Get the facts on Smith & Mills superiority and profit-plus features. Available in 10 sizes ranging from 12" to 36", in plain or universal type, in Economy, Standard and Heavy Duty Patterns.

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SMITH & MILLS SHAPERS, Inc.
DIVISION OF HAMILTON-THOMAS CORP.
HAMILTON, OHIO

a good man to work for you, you have to make the man good by training him for the job that he is fitted best to do.

If he can't or won't do a good job for one man or on a particular job, that is, does not want to produce or he is not interested in that, or he clashes personalities with his foreman, it does not mean that that man is no good at all.

Michael Axler
New York

•

IT WOULD be advisable to neither fire or fizzle, but wherever possible place men in the position where they count most for both employer and employee.

Manufacturers cannot afford to pass up the opportunity when it presents itself to properly place their employees wherever it can be done in their organization.

There are many who have drifted around through their entire life without using their talent in a line of pay dirt. This is so in the case of young people whose parents have sometimes been so intent on placing their offsprings in a certain line of work that they failed to see that the talent of their children does not fit the line of work the parents have chosen for them and prove to be a disappointment instead of a success.

There are many people who started in their working career with the best of intentions at something that they found out later they were not well adapted to and have changed to some other class of work to which they felt they were better fitted, and there are other cases where it has required two or three changes before they found a class of work at which they found themselves comfortable and satisfactory to both themselves and their employers.

Such cases are too common to dismiss at the first failure or even after several trials as there are not very many cases where satisfactory work can be done by an individual in some lines if the applicant is physically and mentally normal.

H. B. Martin
Watervliet, N. Y.

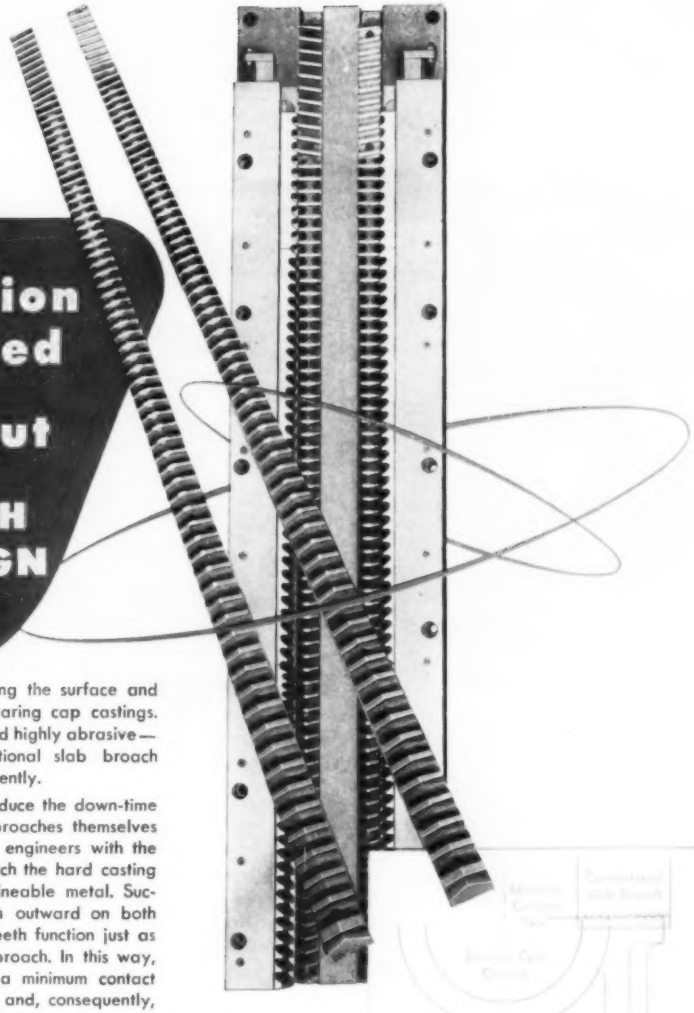
•

WHAT'S NEWS?

NEWS is whatever is of interest to those who will read what is brought to their attention.

Things should be suggested that will make things pleasant for employees, promote good feeling and establish morale and be helpful to

Production increased and costs cut by BROACH REDESIGN



The job in question is broaching the surface and edges of automotive main bearing cap castings. The surface skin is very hard and highly abrasive—so much so that the conventional slab broach requires sharpening very frequently.

To get more production and reduce the down-time for regrinding broaches, the broaches themselves were redesigned by Red Ring engineers with the forward teeth V-shaped to notch the hard casting surface down to readily machineable metal. Successive teeth extend the notch outward on both sides while the final finishing teeth function just as those of a conventional slab broach. In this way, broach teeth are exposed to a minimum contact with the abrasive casting skin and, consequently, hold their cutting edges much longer.

These new broaches have materially increased the parts per grind and the down-time for resharpening has been reduced 70 per cent.

This is one of the many problems Red Ring engineers have solved for broach users. Yours could be the next. If you haven't a copy, write for Bulletin 49-11 on broaching.

NATIONAL BROACH AND MACHINE CO.

5600 ST. JEAN . . . . . DETROIT 13, MICHIGAN

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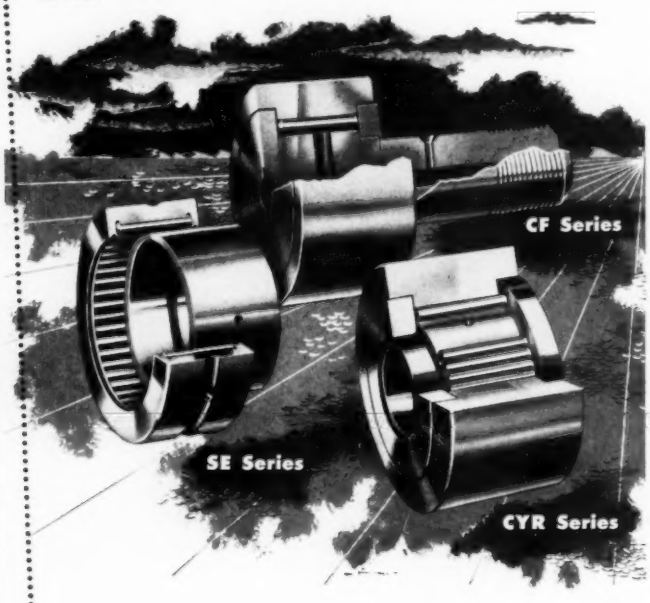
WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

"Longer life and greater efficiency"

with McGILL MULTIROL Bearings



Compared with friction hampered plain bearings McGILL MULTIROL full type roller bearings resist wear because of their easily lubricated roller line contact with raceways. Longer life and greater efficiency is the natural result of the constant precision maintained in the bearing. Lubrication is simplified and required much less frequently. Maintenance is free of costly down time for periodical adjustments and bearing replacement. MULTIROL bearings are your assurance of adding these advantages to the operation of your machinery. Millions in service to date prove such exclusive features as one piece outer race and roller retaining end shoulders, and lubrication reservoirs above roller ends in the SE Series. CF and CYR Series have thick outer race sections for heavy shock load in cam action applications. Mounting is possible with or without stud.

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McGILL MANUFACTURING CO., INC. . . . . BEARING DIVISION
111 N. LAFAYETTE ST. . . . . VALPARAISO, INDIANA

McGILL ® precision bearings

both workmen and the company.

Small plants have an advantage over larger ones in that their managers are able to keep acquainted with and, to a limited extent at least, in personal touch with their employees. Larger companies can use a company publication to do this.

Foremen, due to their close touch with the workmen and the product of the plant, learn points that are interesting and helpful, which are of general interest to both management and employees and can successfully be used in a plant publication.

The editorial staff should be chosen from the most capable who will see that material published is of general educational value, largely regarding the material used in the product that is being manufactured.

Jokes can sometimes be used to arouse interest but must be used judiciously.

What is most essential is to present the use of the product of the plant to its employees and the importance of their product to the world and the value of the separate parts made, that the workmen may realize the importance of each part functioning properly in the hand of the purchaser.

Abel Blakeman
Watervliet, N. Y.

•

No COMPANY'S publication should stick only to lighter things. It should be used to promote not only the company, but also should have many items more serious such as accident prevention, housing facts and figures. It should promote safety, good fellowship, social and economic data. It should tell the company's policies, its outlook, its expectations.

Michael Axler
New York

•

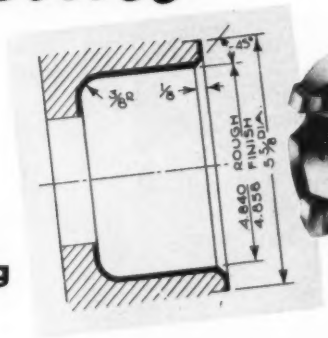
No PUBLICATION can be a success unless the policy for which it was established is fulfilled. Let's not forget that. It would be utter foolishness for some supervisor to suddenly think that the publication should carry company propaganda when the publication was established only to be a medium by which various departmental personnel learn what is being done or happening in other departments.

So we might say that a company publication can have several courses when starting life. It can be revamped if everyone is aware of the change in policy and in favor of it. The readers make or break your publication. If you want to carry

McCROSKY *Specials*

COST CUTTING TOOLS

Perform related boring, facing, chamfering and reaming operations



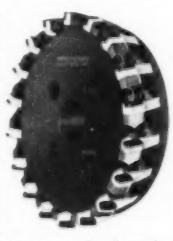
at the same time with just 1 tool

cutting machining and set up time assuring close alignment of all surfaces and unsurpassed uniformity of finished pieces

Expertly engineered to the requirements of each individual job, McCrosky "Specials" speed production and cut costs. They pay their way on short as well as long production runs. Use of McCrosky's Jack-Lock® wedge, and other ingenious ***and exclusive*** design advantages give McCrosky "Specials" the strength and rigidity of solid tools, yet permits the blades to be released and adjusted for regrinding—accurately and quickly — saving time and minimizing the amount of blade stock ground away.

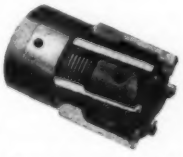
Send for Bulletin No. S-17. It illustrates more than 40 applications of McCrosky Specials — describes the work they do — and will suggest places where ***you too*** can use McCrosky Specials to turn out better products, quicker and cheaper!

McCROSKY *Jack-Lock* MILLING CUTTERS



Face mills, end mills, half side and staggered tooth designs, featuring McCrosky's exclusive Jack-Lock® wedge that permits the blades to be locked solidly, and released for adjusting and reblading easily and quickly, ***without hammering.*** High speed, cast alloy or carbide tipped blades for cast iron, steel or non-ferrous work. **Send for Bulletin No. 17-M. It gives full details.**

McCROSKY *Super Adjustable* REAMERS



Shell, and straight or tapered shank chucking types, to 6" in diameter, each featuring McCrosky's exclusive pin and screw locking device that holds the blades rigidly in the body. These reamers cut freely without chatter or tendency to "dig in", and produce round concentric holes with high finish, even at high speeds and feeds. High speed, cast alloy or carbide tipped blades. **Write for Bulletin No. 18-R. It gives full details.**

McCROSKY *Block Type* BORING BARS

Straight or tapered shank design, with or without pilots, for holes to 15" in diameter. McCrosky's exclusive, patented, tapered and hardened V-pin centers the cutter block accurately and solidly, yet permits easy release for regrinding; and "floating" with extreme accuracy, when making finishing cuts. High speed, cast alloy or carbide tipped blades. **Write for Bulletin No. 17-B. It gives full details.**

McCROSKY TOOL CORPORATION

MEADVILLE, PA.

Special MULTIPLE OPERATION TOOLS
Jack-Lock MILLING CUTTERS
Super Adjustable REAMERS
Block Type BORING BARS
Turret TOOL POSTS
Wizard QUICK CHANGE CHUCKS

Start With Any One of These

FOUR WAYS To Cut Your Handling Costs

1 WITH ROLLER OR BELT CONVEYORS

— Wherever packages, parts, or units have to be handled — do it faster, better, cheaper, with Standard roller or belt conveyors, power or gravity. Standard also builds slat, chain, wheel, or pushbar conveyors to fit your needs.

2 with a HANDIBELT

— a small, light, compact, easily portable and maneuverable conveyor unit that stacks, loads, unloads cases, cartons, packages up to 135 lbs. in weight. Can be used inclined, declined or horizontal. Electric motor operated.

3 with SPIRAL CHUTES

— effective time, work and money savers lowering pieces, parts, packages floor to floor. Scientifically designed and properly pitched—available in many types and sizes. Cost nothing to operate.

4 with PNEUMATIC TUBE SYSTEMS

— provide swift, sure, safe transportation of messages, documents, blueprints, samples, small parts, money; cylindrical or oval tubes 1½ inch upward with dispatching and receiving terminals for complete systems to meet your needs. Write for special bulletin SPT.

Write for Standard's general Catalog AM-11. Tell us what you want to handle or name equipment on which you want more information.

STANDARD CONVEYOR COMPANY
North St. Paul 9, Minn.
Sales and Service in Principal Cities

Standard GRAVITY & POWER CONVEYORS

plant messages to the workers then make sure that they understand why this is being done. Tell them, not through the publication alone, but in mass meetings of the change in publication policy.

From my own experience with many different company publications I feel that there is merit to a publication that tries to interest its employees in learning more about the things of everyday business. Telling them over and over what profit and loss means. What strikes mean to them. How they can obtain more purchasing power without excessive wage increases and work stoppages. A company publication can very subtly get these points over if the editor of the magazine or paper is on his toes and knows his readers.

The general fault with many publications is that the editor who writes the company story does not slant it to the reading employees and their families. The use of pictures and single syllable everyday words and phrasing that can be easily read is the answer to success. Study the union publications. Listen to union speakers. Note how they appeal to the average employee. Slant the company publication in the same way. Always make sure that the publication carries light material, data on happenings at the shop. Never let the supervisor write these up. Have the editorial staff of actual workers in each department do it. Let them become part of the publication. Let your employee know that the publication is for him and his interests.

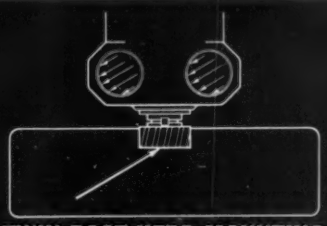
Charles D. Townsend
West Hartford, Conn.

•

EMPLOYEE magazines issued by companies can be used to good advantage to promote the company provided the promotion is such as will stand close examination, provided promotion is not overdone, and provided the material comes from sources other than foremen. The average foreman has enough slippery psychological problems to handle without sticking his neck out in an employee magazine. If he were to say anything very definite in an article, he would certainly be suspected of taking an oblique shot at somebody, or of grinding his own axe in one way or another. If he tries to mush through without being definite, he cannot command any respect for what he has written.

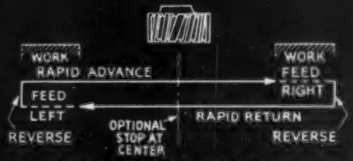
For the most part, an employee publication should deal with the interests of the employees. But that

KENT-OWENS *Plus Features* Give You PLUS PRODUCTION!



TWIN POST HEAD MOUNTING

Head mounted on two cylindrical ground steel posts which carry spindle midway between them—an *exclusive Kent-Owens feature!* No overhang.



WIDE RANGE OF AUTOMATIC CYCLES

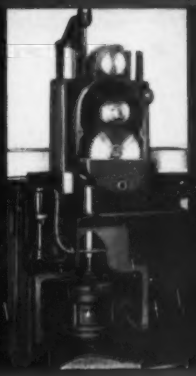
Hydraulic feed used on all Kent-Owens power feed machines. Wide range of automatic cycles available including intermittent milling, etc. Independent feed rate for both directions of table travel permits doing entirely different operations at opposite ends of table.

You'll find Kent-Owens Milling Machines the cost-cutting answer to a wide range of milling jobs! They're *rugged, simple, versatile* . . . with practical features that reduce machining time . . . save labor . . . and maintain high precision. Write for bulletins on the Kent-Owens Standard line . . . including wide range of hydraulic and hand operated machines. Also, let our engineers help you with tooling and special machine requirements. Kent-Owens Machine Co., Toledo, Ohio.

Call on
KENT-OWENS
for Milling Machines

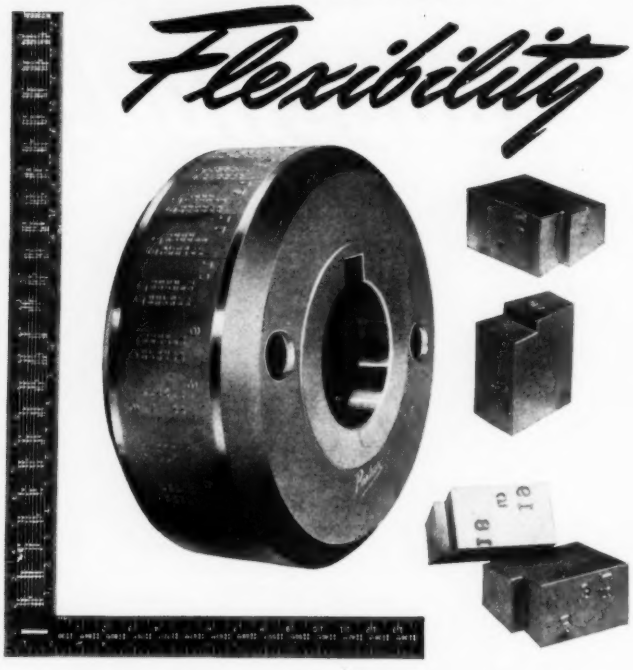
ONLY TWO GEAR CONTACTS ...MOTOR TO CUTTER

Drive is unusually simple and direct, being taken from a standard foot mounted ball bearing motor at rear of machine. Wide range of spindle speeds by changing pick-off gears.



BUILT-IN MARKING DIE

Flexibility



WITH PARKER'S INTERCHANGEABLE SEGMENT ROLL MARKING DIE

- One roll marking die to tackle the exacting job of marking thousands of carpenter's squares. Clear accurate lettering was just as sharp for the 1000th impression as for the first.
  Individual segments can be removed, changed or replaced in seconds. One Parker Roll Die does the job of dozens of solid roll dies.
- The *flexibility* of Parker's Patented Taper Lock roll marking dies is solving difficult marking problems — saving down-time — saving money — every hour, every day for cost-conscious progressive manufacturers. This is but one of the exclusive Parker marking dies.
- For a better mark on *your* product, faster, cleaner, and at less production cost — investigate the *flexibility* of Parker's facilities. From stock marking numbers to specially engineered marking devices. Mechanical engraving and embossing. Parker marking dies for steel, brass, aluminum, plastic or wood.

SEND FOR THE *PARKER BLUE BOOK*

Steel Stamps
Marking Dies
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Mechanical Engraving and Special Marking Projects.
Be sure to have the *Parker Blue Book* in your file.

THE PARKER STAMP WORKS, INC.
MARKING DIE & MACHINERY DIV.
FRANKLIN AVENUE • HARTFORD, CONNECTICUT

by Parker

does not mean that a frank statement concerning company policy, or some reminder in the interest of both company and employees, cannot well be included.

Take the proposition of absenteeism as an instance in point. Suppose an item appears giving the collective amount of wages lost by company employees through absenteeism during the foregoing month, quarter, or year, including the frank statement that the company also lost through this absenteeism. Suppose that, in connection with this the company offers a given reward (be it large or small) to all employees whose attendance records are perfect over a given length of time. In such a proposition the cards are all on the table, and consequently there is no reason why there should be any bad effect. Many similar methods of increasing general plant efficiency might be discussed in such a magazine.

The employee magazine also offers means for advantageous employee education, if given out in small doses. There are many employees, for instance, who have no comprehension of the various expenses for which a company is liable. In a rough sort of way, they have an idea that cost of raw material plus the cost of labor is the cost of the finished product, and that anything beyond this in the selling price is profit.

It would certainly do no harm to give them an idea as to what depreciation means, with its inevitable effects. This could be done in language that would bring it clearly home. Various other things, including fire and casualty insurance

"I don't see why they're called breast drills . . . this is the only way I can see to use them!"

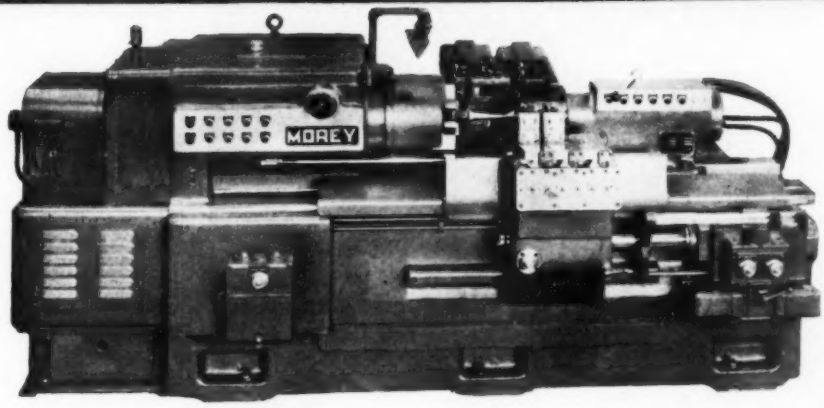
high production MOREY AUTOMATIC LATHES

UNIT DESIGN

For greater flexibility and quick tooling set-up.

TOOL RELIEF CAPACITIES

Increases tool life and maintains close tolerances. Available from automobile drive pinions to gun forgings.



These rigid and powerful machines turn rough forgings to the finished size in one chucking, maintaining tolerances of .001", and using tungsten-carbide tools the way they should be used. Let us show you how these lathes pay for themselves in an amazingly short period, and write for full details to

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Designers and Builders of Lathes that are Setting Tomorrow's Pace

For really *tough* going—

GORHAM M-40-U ALLOY

RESISTS WEAR AND ABRASION

3 to 10 times longer!

So superior is this alloy that *by actual test* it has shown results 3 to 10 times better than high speed steel and other alloy materials for centers. Standard "M-40-U" alloy tipped centers can be furnished from stock. Special "M-40-U" alloy centers can be furnished to your specifications, or our engineers will help you design special centers to fit your needs. Choose GORHAM "M-40-U" for top performance and long wear.

GORHAM TOOL COMPANY

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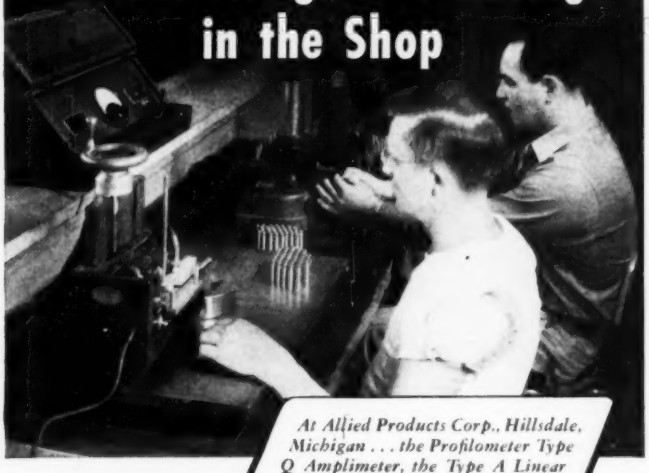
The FASTEST way to get
Surface Roughness Ratings in the Shop



At Allied Products Corp., Hillsdale, Michigan . . . the Profilometer Type Q Amplimeter, the Type A Linear Pilotor and KA Tracer in use.

is with
THE PROFILOMETER

Where precision parts are produced in high volume—as they are at Allied Products Corporation—both production inspection and final inspection operations must be geared to handle a steady and substantial flow of work. When surface roughness measurement is a production requirement, it is the Profilometer that provides the fastest and simplest method of securing accurate readings.

The Profilometer has a normal tracing speed of ¼" per second—far faster than any other instrument of its type. And in the time required to make a shop check of surface roughness by comparative methods, you can take *several* Profilometer readings. In addition, Profilometer equipment can be moved from machine to machine and set up quickly and easily.

Of most importance, you get this speed of surface roughness measurement where you need it—*in your production departments.* Because the Profilometer is a ruggedly built instrument, it can be used anywhere in the plant and operated next to machines by the set-up men or the machine operators themselves. It is designed not as a laboratory instrument but as a shop tool.

Regardless of the type or volume of your production, you will always find the most *practical* method of measuring surface roughness in the shop is with the Profilometer.

GET THE WHOLE STORY in these free bulletins. Write for them today.

Profilometer is a registered trade name.

PRC
PHYSICISTS RESEARCH COMPANY
Instrument Manufacturers
ANN ARBOR 4 • MICHIGAN

could be brought up for educational consideration. This would go a long way toward blocking professional trouble-makers from playing on the ignorance of uninformed employees.

All such information that a company might like to get into the minds of employees must positively represent only a small part of the editorial content of an employee publication. Employees cannot be expected to gulp down large doses of anything that looks like company promotion while closer interests of those same employees are more or less ignored. Bill Jones' new baby, Harry Smith's new wife, and the loss by death of Mary Perkins' mother, are items of far greater importance to the employees. Joe Campbell's loss of a finger joint at the press, or the big fish Mike Adams caught while on vacation, simply must not be ignored to make room for company promotion of any kind.

John E. Hyler
Peoria, Ill

•

SORCERER'S APPRENTICES

WE HAVE a saying, "A master is not born, but made." That applies to any profession—doctors, painters, and mechanics.

You cannot have a good man in any trade unless you train him, and you must have a good man to know his job and to be able to train others. Not every man can train others; that in itself is a profession.

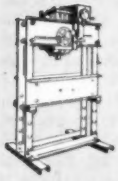
I have seen and I know of many good toolmakers and machinists who are crackerjacks on their jobs but cannot train others. On the other hand, I have seen apprentices who know nothing of the job that they have to do, but by watching the other fellow, will soon be able to do a better job than the fellow they are watching.

It is wrong of any organization to take in apprentices and not to have some training courses; wrong to put a man on a machine and set it up for him and tell him go ahead and produce.

It makes no difference how big a shop is; there should always be a planned out apprentice-training program, also someone in charge of that training program. He should make recommendations and changes wherever it is necessary, to make improvement for better training for all concerned.

Every foreman in his department should be trained himself to be able to give instructions to some men in his department; to train the apprentice; to see that the apprentice is

Unusual machines for a wide variety of industrial applications



1. 150-Ton Electdraulic Press

Motor driven heavy duty hyraulic press; pre-set controlled tonnage; ram speed 12" down, 13" up per minute; ram travel 12"; bolster travel 28"; work can be fed from side or front; one operator can center work and control press.

2. Reamers, Dual Spiral

Dual spiral cutting action, one dual spiral reamer replaces five standard expansion reamers, straight or tapered shanks.

3. Tool Post Grinders

Attachment for lathes, shapers, planers and millers; Applications: internal, external, face and taper grinding.

4. Presses

For every purpose, sizes: 2 ton, 3 ton, 10 ton, 25 ton, 40 ton and 60 ton, hand, hydraulic, air or motor driven.

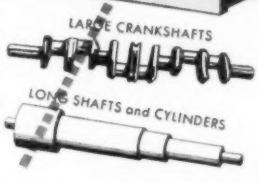
5. Ball Bearing Die Sets

Features ball bearing bushing, long die life, perfect alignment, cleaner cutting.

DIESEL CRANKSHAFT and CYLINDRICAL GRINDER

with traversing wheelhead reduces initial investment by 2/3—

Due to unique design the Supersize Lempco DCG Grinder is approximately half the length of other large grinders, yet equals or betters the capacity of other types and is available at ⅓ the cost.



Look at this capacity:

Chucks a shaft up to 224" long with a 40" swing yet the entire machine occupies only 24 feet of floor space and is just 7 feet high. The grinding wheel has a hydraulic traverse and infeed that adapts itself for grinding long cylinders and shafts such as cam ground steel mill rolls, printers rolls in addition to diesel and industrial crankshafts.

Write for Bulletin on Diesel Crankshaft Grinders.

LEMPCO PRODUCTS, INC.
Industrial Division
5490 DUNHAM ROAD
BEDFORD, OHIO

LEMPCO

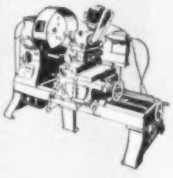
For 35 Years—a leading builder of machine tools

6. Hypermatic Punch Presses

Revolutionary, reciprocating action, High speed blanking press capable of 1800 strokes per minute.

7. HGX—Grinder—Lathe

Combines work of grinder, lathe and borer; 53" swing; automatic cross feeds! hollow work spindle; face plate; grinds or turns large surfaces, internal and external tapers; small model ACX also available.



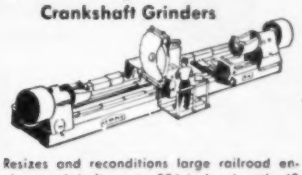
8. Speedmaster ReamORhone

Wet ream and wet hone on one machine, quickly interchangeable from reaming to honing.

9. Mobilcrane

Eliminates need for overhead hoists and rails, capacity up to 2 tons, boom travel to to 6'8" (Boom extension available) Portable.

10. Diesel Engine Crankshaft Grinders



Resizes and reconditions large railroad engine crankshafts up to 224 inches length, 40 inch swing; other models up to 382 inches length 60" swing. Also cylindrical grinding operations. All of the accuracy and features of the smaller world-famous Lempco automobile and truck crankshaft grinders.

11. Disc Surface Grinder

Tilt-table, spring floated disc grinder with coupled air suction and waterfall grit remover. For flat grinding of castings or other metallic surfaces up to 19" wide. Larger wet grinding fully automatic models also available.

SEND COUPON FOR DETAILS

LEMPCO PRODUCTS INC. (Industrial Division)
5490 DUNHAM ROAD • BEDFORD, OHIO

Gentlemen:
Kindly send additional details on the following equipment or machines:

☐ 1. 150 Ton Press ☐ 2. Reamers ☐ 3. Tool Post Grinders ☐ 4. Presses ☐ 5. Die Sets ☐ 6. Hypermatic ☐ 7. HGX Du-All ☐ 8. ReamORhone ☐ 9. Mobilcrane ☐ 10. Diesel Crankshaft Grinder ☐ 11. Surface Grinder

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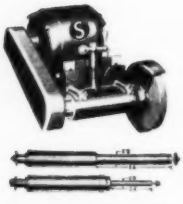
TOOLS FOR EVERY SHOP!

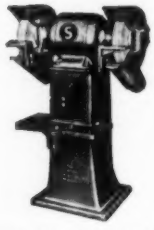
TYPE TD heavy duty twin wheel tool grinder. (Also single cup wheel). 10TD 10" and 14TD 14". For carbide, stellite, or high speed steel tools. Floor space conserved by placing grinder against wall. No time lost between rough and finish grind. Positively no spray or splash when grinding wet.

PATENT PENDING

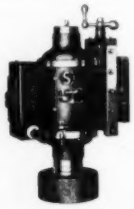
TYPE BDG. Single speed 1 H.P. 10" to 50 H.P. 30". Also multiple speeds for maintaining peripheral speeds as wheels wear.



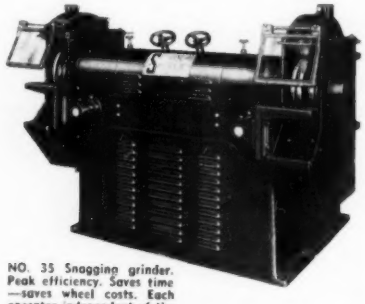
TYPE BPA. ¼ H.P. to 20 H.P. A 2 in 1 precision tool. Grind externally, and in a few minutes mount an interchangeable quill for internal grinding up to 24" deep.



TYPE FAS. Equipped with push button safety starter, tool tray and water pot, adjustable wheel guards, spark breaker and work rest. 1 H.P. to 7½ H.P.



TYPE PAV. Vertical spindle grinders. Easily mounted on planers, boring mills, shapers, milling machines, etc. ½ H.P. to 10 H.P. Speeds: 3600, 1800, 1200 R.P.M. with or without feeds.



NO. 35 Snagging grinder. Peak efficiency. Saves time —saves wheel costs. Each operator independent of the other. 9500 S.F.P.M. can be maintained on resinoid bond wheels down to wheel flanges by adjusting wheel guards through "Hand Wheel"! No gears or belts to change. Positive interlocking control—wheels cannot be over speeded. Two 5, 7½ or 10 H.P. motors for wheels from 20" to 30" in diameter; other sizes up to 100 H.P.

WRITE FOR CATALOG 44 TODAY!

ALSO:

GRINDERS—ALL KINDS! UP TO 100 H.P.
BUFFERS—POLISHERS UP TO 60 H.P.
ABRASIVE BELT MACHINERY
SPECIAL MACHINERY

THE STANDARD ELECTRICAL TOOL CO.

2480 WEST SIXTH ST. CINCINNATI 4, OHIO

qualified to do the job he is trained to do; to see if the apprentice likes to do what he is trained to do. Maybe the apprentice might not be fitted to do the certain job that he is being trained for. He might not like it, he will not have his heart and soul in it. Then there will be a lot of spoiled work if the apprentice does not like the job. Therefore, the foreman should see to it to have a talk with the apprentice to find out, as to what said apprentice would like to do—his preferences—then put him on that job that he likes to do the best. You will be surprised how much production you will get from the man. Not all men that you take in as apprentices will turn out to be good mechanics. Some you will not be able to train to do anything without spoilage. Those men do not belong in a manufacturing plant. You might be able to make good laborers or helpers or good stockmen out of them. Some you might even be able to train to be good supervisors, foremen, and some good office men.

In training apprentices the training program should have not only to train the man to produce some kind of manufacturing product, also he must be trained to be safety-minded on his job and to look out for others that are not, to preach safety to others that are not safety-minded.

Also when an apprentice is trained to give a day's work for a day's pay he will do so.

Michael Axler
New York

•

WHEN we look back at our own youth and recall the way we were trained to do a job we cannot help but appreciate apprentice training. These young men need our help and guidance. By helping the apprentice we are helping ourselves. A man may lose his money, but he does not lose what he puts into his head. An investment in knowledge pays dividends; so does a good training program.

These young apprentices have faults, and we must be considerate of those faults. If we work on the good qualities of these apprentices we will more quickly cure the faults. Young or old we all work better under the spirit of approval and encouragement. Everyone likes to be recognized for some particular good ability. We must let these apprentices know we honestly appreciate good work and good work habits.

When we don't like the way they are doing a job we should tell them so at the same time explaining our

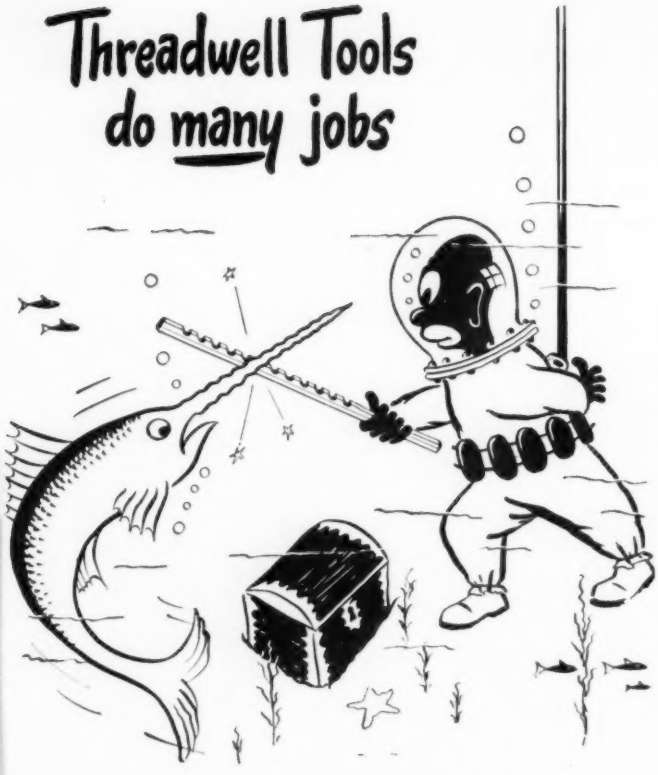
all under one roof

Van Huffel designs and builds the forming dies . . . in addition to cold forming in continuous lengths: Welded, Lock Seam, Open Seam and Butted Tubing; Shapes, Mouldings and sections in Hot or Cold Rolled Steel, Stainless Steel, Copper, Brass, Bronze, Aluminum, Zinc, etc. in gauges up to 5/16 inch . . . . . all to your exact specifications.

Write today for illustrated brochure showing the wide range and diversified application of Van Huffel Shapes and Tubing.

METAL SHAPES • TUBING
Welded • Lock Seam • Open Seam • Butted

Threadwell Tools do many jobs



they can do your tough ones

Solving your gaging and cutting tool problems is easier than you think. Threadwell Field Engineers are located all over the country to help you. Get their names by mailing coupon below.

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Please send me the name of the Threadwell Field Engineer and the Threadwell Distributor nearest me. I am also interested in the literature checked below.

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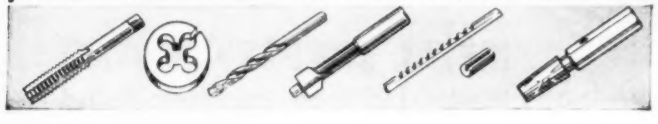


reasons. The power of suggestion and encouragement will take the sting out of our corrective methods.

I, for one, want my son to be trained in the more modern methods of training. I want him to know as much as possible about the position he is assigned to. This will increase his chances for advancement and will make him more valuable to his employer.

A. E. Salmons
Philadelphia

•

THERE is practically always a shortage of skilled help. No ambitious young person is satisfied to work very long where there is no chance to learn.

If competent workmen could always be secured, it would go without saying that there would be no need for apprentices.

However, such is not the situation. It takes practice to make perfect in all lines of work, and the machine shop which uses a large variety of standard and special tools probably requires skill in more different lines of work than most any other trade. Furthermore, the varieties required are constantly increasing day by day.

The large organizations are meeting the situation with very thorough apprenticeship courses. Smaller organizations, while not able to carry through such complete courses, are in most cases for self preservation, going so far as they can to educate their help.

There are very few shops where there is not enough simple work to do for them to start untrained help with and gradually advance them into the more difficult work as fast as they are able to learn.

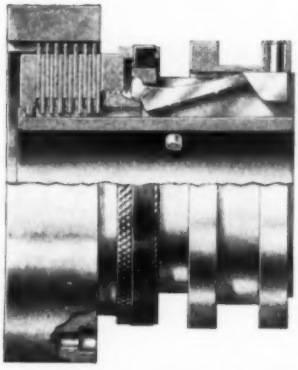
I know of one shop where about 50 were employed where they had an apprenticeship course of four years for which they paid about half the price that they paid common laborers.

The foreman of this shop, when a laborer came for a job, told him that he could expect to get the hardest and most undesirable work they had but that if he did his best he could expect to be rewarded according to his ability and that learning was more from close observation than actual teaching and any that showed interest in their work would be helped all possible.

This particular man after about two months laboring work was placed as helper with a first-class machinist where he was instructed by the mechanic. After a few weeks he was placed on a machine tool and then on other machine tools as he

MAXITORQ

Keeps Good Company ....



in the MINING FIELD

We are pleased this month to pay tribute to the Joy Mfg. Co., Pittsburgh, Pa., for its remarkable 18-HR-2 Rock and Ore Loader ... and to express our gratification for their selection of Maxitorq Clutches as original equipment.

Two double No. 27 Maxitorq floating disc Clutches ... one for each crawler tread ... control the power for independent forward and backward movement that permits precision maneuvering and positioning of the loader.

Only a ruggedly-built clutch can stand up under the tough going of this "battleship" machine that loads up to *12 tons of ore per minute*. Maxitorq is taking the job in its stride.

If you have a tough job requiring positive clutch action and long life ... or an application calling for overload protection of a shear pin nature ... ask our engineers for practical recommendations. Within its capacity (to 15 H.P. at 100 r.p.m.) there's no finer clutch made.

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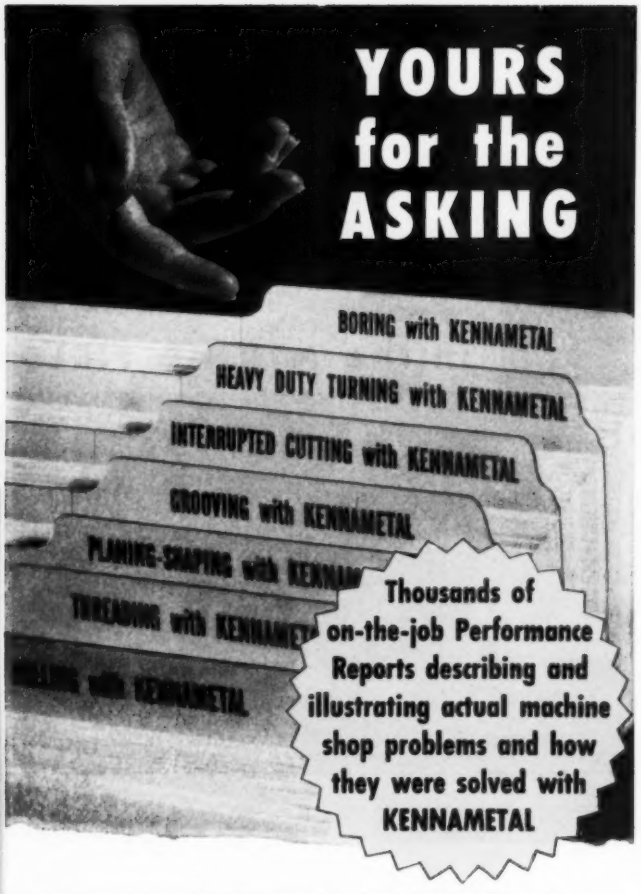


• Suppose you could ask thousands of practical machine shop men —*"What was the best production idea you had this year?"* Wouldn't their answers save you headaches, time, and money?

Kennametal Inc. has the answers—more *practical* information on jobs of diversified types on all kinds of materials than has ever before been accumulated and offered.

Jobs are classified so that we can send you data sheets on that type of work that interests you. Just ask for Performance Reports and mention the general type of job and material.

Do we have reports on the "tough" jobs you have solved with Kennametal tooling? Our representative who calls on you will appreciate the details.

KENNAMETAL *Inc.*, Latrobe, Pa.

MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES
AND CUTTING TOOLS THAT INCREASE PRODUCTIVITY

gained experience, and finally was given machinist pay as well as machinist work. Something over five years later he was made foreman in another shop of about the same size, but which had a class of work of a higher grade.

While such experiences are not common practice, it does show what can be done.

H. B. Martin
Watervliet, N. Y.

•

THE IDEA of setting up a separate training department for a term of instruction for boys who desire to become mechanics is not only the best and quickest method to make good machine operators, but it is the most economical even in a shop of medium size.

One or more all-around mechanics, if they are chosen because of this fact of being good men, can bridge the gap in a boy's life between any schooling and shop work without the waste of manhood or good material which goes into the product.

In any trade, young men must be broken in if they expect to make a living by using their brains and braun. Apprentices become old hands only by means of effort and study, and sometimes not then.

An old mechanic used to say, Apprentices, they are either dopes or doers," and he knew whereof he spoke, for apprentices soon become members of one class or the other and it does not take long to discover which. In any vocation, only by experience can apprentices become journeymen.

The subject, whether or not to have apprentices, may be largely dependent upon the product manufactured. In some plants, apprentices may turn out as much and as good work as men who have spent some time performing the operation.

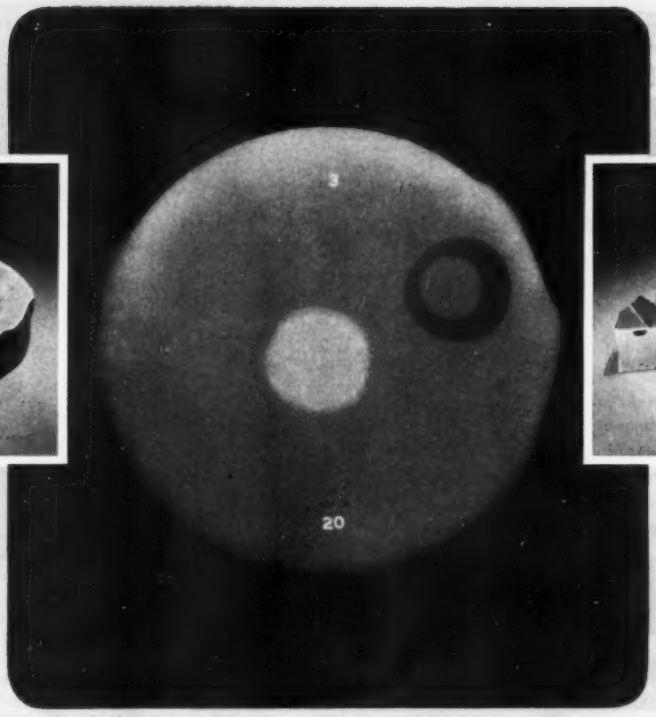
Consider a case where strip steel is the raw material and punching holes in it or hand tapping threads is the operation. This may be done by an apprentice, as good as an experienced man can do.

In such cases, apprentices may be a good investment, but, if the operation is complicated, it may take time for them to learn it during which some spoilage is bound to occur.

Because of a hot-headed foreman, many a boy has been disappointed and discouraged after entering a plant expecting to learn a trade.

One company has an experienced mechanic as an instructor of apprentices. He goes from one department to another, is very pleasant, keeps the boys in line in the various

Aluminum alloy casting 2¼ x 1¾" for aircraft accessory part.



Radiograph which revealed defect in casting.

Section reveals hole detected by radiography.

Minutes of Radiography saved hours of machining

AFTER machining, this aluminum alloy casting was to be an important part in an aircraft accessory, vital to high-altitude flying. The finished part was needed quickly by the customer. Design specifications demanded high quality.

This was no time to wait for machining to disclose any defects. There was too much to lose —setup time, machining time, take-down time, as well as the reputation of the foundry.

Radiography saved all that. In a few minutes it revealed a defect that caused rejection of the rough casting at the foundry. Other castings, proved sound by radiography, were sent to the customer.

Cases like this show how more and more foundries are able to release only sound castings. Perhaps even more important, radiography is showing how to make consistently sound castings, by picturing the internal effects of changes in gating, venting, chilling, pouring temperature, and other variables.

Ask your x-ray dealer to explain how radiography can help you increase yield and cut costs.

EASTMAN KODAK COMPANY
X-Ray Division, Rochester 4, New York

Radiography . . .

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- for interchangeable parts.
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departments and teaches care as well as action at all times. He has saved many boys from becoming dopes and has been fortunate in keeping the boys working to the firm's advantage and in keeping down the amount of waste and scrap.

This instructor has much in the way of book learning as well as practical experience and is always encouraging boys to be progressive, industrious and honest.

While Ed says that they have not enough business to have a school for teaching boys in the trades, one of the plans of instruction mentioned here would be a great help to any firm.

Of course, if a single man is selected to be the instructor, he should have a personality suited to the job. He should be patient, pleasant, industrious, use good language and if he is witty, this will help.

F. H. Stebbins
Worcester, N. Y.

•

THE QUESTION posed is whether companies of small and medium size can afford apprentice training programs. For a moment let us think of what this means. Our industries today, both large and small, are faced with the fact that skilled men are not available. We ask why. There are probably many answers but there are two that seem uppermost in our minds. First, many of our young fellows have obtained from our educational systems the idea that a democratic way of life means no hard work and a large income for doing nothing. These youngsters are not interested in jobs that require years of training on the job. They are not interested in learning the special techniques to become a skilled worker. They want to secure jobs that do not require skill but will bring in big money through unionized control.

This is one reason why certain industries today are going out of business or having to curtail production. Now the second reason for lack of specialized men is the failure of industry to have adequate programs for the training of employees. Many years have gone by and industry in general has neglected to help young men do their jobs better by showing them how to do them better. The policy of "oh let him find out by himself" has stifled the worker. Thus we see that apprentice training of some type is badly needed.

Large companies within the last few years have suddenly become aware of this need. Some have also

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. . . and still get "something special"

Yes...you may select your required taps from a complete line of Hanson-Whitney *standard* styles and sizes and still get "something special."

And by "special" we do not mean extra-cost, made to specification taps. We mean standard extra quality "finished" taps...ground after hardening to give you the keenest cutting edges, the highest accuracy in lead, angle and diameter. All customary sizes in Hand Taps, Machine Screw, Nut, Tapper, National Hook, Pulley, and Pipe Taps are stocked for fast shipment in protective, clear-labeled, cartoned boxes. For maximum tap life and maintained accuracy, specify H-W.

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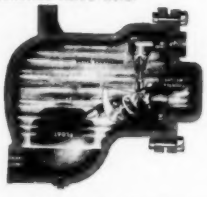
4 WAYS TO SAVE TIME

in Production and Maintenance

On the basis of their time-saving records, leading shops are increasingly standardizing on these 4 Nicholson units. For details, send for the individual bulletins listed here.



NICHOLSON AIR TRAPS—For intercoolers, aftercoolers, receivers, tanks, etc. Non-wire drawing valve opens and closes instantaneously. This feature and extra large drainage capacity effect fast, positive action. 3 types for pressures to 1500 lbs. Catalog 250.

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NICHOLSON CYLINDER CONTROL VALVES—Specially treated hard seats, choice of metals for specific mediums, and easy repacking cut maintenance time. 2, 3, 4-way and special types. All manner of operation. Size ¼" to 2½"; pressure to 5000 lbs. Catalog 546-A.

W. H. NICHOLSON & CO., 114 Oregon St., Wilkes-Barre, Pa.

No flies on us...

Bearing shown (No. 2 Radial, enlarged 3 Diameters) is one of more than 70 different types and sizes manufactured to the highest precision tolerances in our completely air-conditioned plant. MPB bearings are made by the experienced originators of miniature ball bearings and standard extra operations (MPB bearings for example are burnished, not merely ground, on all functional surfaces) assure you of finest quality components for your instruments.

Complete and competent engineering assistance for your applications is promptly available, thru 18 convenient offices with bearing stocks in East, West and Mid-Continent Cities. Or send for Catalog AM

MINIATURE *Precision* BEARINGS
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discovered that the majority of their top executives are reaching retirement age with no trained replacements on hand within the company. I point this out as a parallel example and to emphasize that industry, big and small, has been far too smug during the past ten to fifteen years in personnel advancement.

How should the small and medium size company approach the problem of apprentice training? Don't make it appear that you are running a school. Establish your program in an attractive manner. Yes, it will cost you money—anything in this world of ours costs money if it is worth obtaining. The use of modern training methods such as motion pictures and slides can reduce your apprentice training periods and actually save you money. You must also make use of the old-timer-to-student basis. This helps build up the goodwill between the working forces in the shop. Remember the old-timers resent newcomers and we must prevent this resentment from occurring.

Frequently it is well to obtain technical advice and aid from some company familiar with training programs. Programs can be obtained from a number of sources. Many of them can be utilized to full advantage but frequently they must be adapted to the existing conditions within the specific company.

Whatever is done, let us not forget that our tomorrow depends upon how good a job we do today in training our apprentices, in equipping men to carry on the skilled work in the critical industries controlled by our small and medium size companies.

Charles D. Townsend
West Hartford, Conn.

•

PROBABLY there is no other one subject around which so many fallacies cling as that of apprentice training. It is absolutely impossible to escape payment of training costs in one form or another. In the apprentice-training department, cost of training apprentices up to a point may be directly known. Where new employees are trained directly in departments where they are to work, and are now and then placed on productive work of simpler types, training costs persist, but what is paid teachers in apprentice-training departments is lost in another way or other ways. This includes considerable spoiled work, of which Al's men are complaining.

Actually, there never comes a time when any man reaches the uttermost

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Quality of welds is unsurpassed with tip life increased as much as 300% over previous welders.

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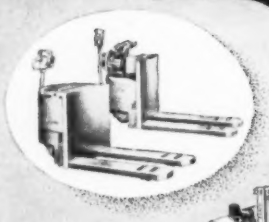

STEADILY RISING COSTS—growing user demands—imminent labor shortages! These very real conditions need not pose frightening problems to alert and able management. Given proper machines, manpower can deliver a great deal *more* power—and enjoy doing it; more power that translates into greater production at lower cost. Now that CLARK has added Powered Hand Trucks to its *Leadership Line* of Fork Lift Trucks and Industrial Towing Tractors, it is better fitted than ever before to help Management meet the challenges of a most critical era. For it is in the field of Materials Handling that the greatest opportunities for savings, for increased production, for improved efficiency and for the betterment of employee relations are to be found. In every piece of CLARK materials-handling equipment, there is MORE POWER FOR MANPOWER. And it is yours to employ—yours to enjoy.

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limit in knowledge and skill. Therefore, the very same type of costs exist in every department at all times. After the teacher has discharged his student and he emerges from the so-called apprentice class, he goes on learning for the rest of his life, though the fact may not be so evident to the casual observer.

If it were practical (which it is not) to make such an experiment, it would be highly interesting to have two very large and identical plants engaged on precisely the same work under the same circumstances, with the exception that in one all workers would be primarily trained in an apprentice-training department, while in the other all of them would be trained from the raw state right in the department where they were to work. It can hardly be denied that teachers (regardless of how efficient they may be) who are under necessity of giving men more or less general training cannot be expected to train them to the same point in efficiency in given length of time that the department in which they are to work could train them.

Neither can one overlook the inescapable fact that mere orientation takes time and costs money. Skilled machinists who have left a plant or department where they have labored many years, and have entered another, can bear witness to the fact that a period of relative awkwardness ensues, regardless of their considerable knowledge. Not only will there be machines and tools differing in considerable degree from those to which they have been accustomed, but the foreman will have ideas of his own which may be utterly incompatible with those entertained by the previous foreman. Therefore, when a supposedly trained employee is released from classes into production, the same thing can be expected. In other words, such an apprentice must undergo two separate periods of orientation, whereas if he is trained directly in the working department there is only one.

Training apprentices in the working department must not be a hit-or-miss affair, however. That is probably the cause of most of the trouble in Al's department. When a raw employee is permitted to skitter around through a department, asking just anyone and everyone for solutions to his problems, both apprentice and company are at a disadvantage. There are usually men with a crude sense of humor who get a kick out of spoofing an inexperienced employee. This not only

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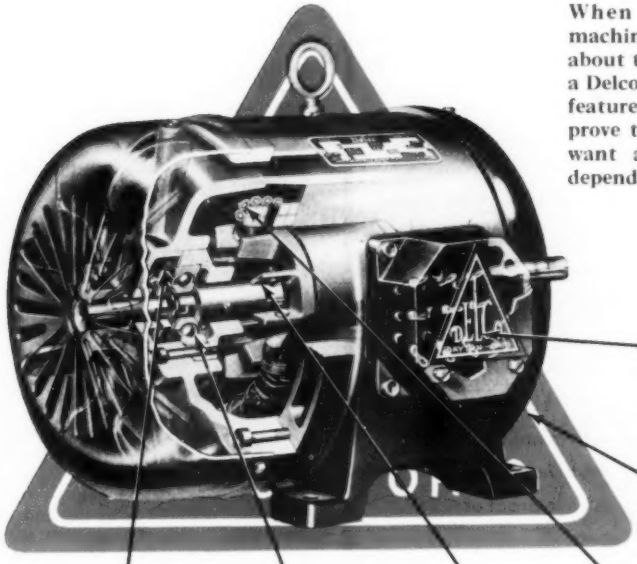

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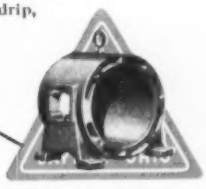
Protects against drip, splash



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Maintain shaft alignment

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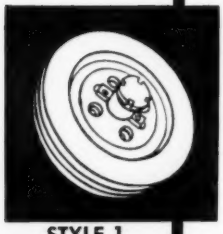
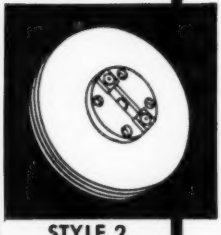


STYLE 1



STYLE 2

STYLE 3

IMPROVE *milling cutter performance*

INCREASE *cutting blade life!*

You can increase milling production, improve accuracy and lengthen blade life by using Lovejoy Flywheels. Steel cutting is as smooth as silk, and other metals are usually cut easier and faster with the help of these patented Flywheels. One manufacturer reports a 10-time increase in blade life. Others report complete elimination of chatter with resulting improvement of surface finish. Still others have proof of reduced H. P. requirements.

Lovejoy Flywheels are available for mounting on the spindle of any machine . . . Style 1 for driving shell end mills; Style 2 for bolt-on mills; Style 3 for bolt-on or National Standard arbors.

The Lovejoy Flywheel Bulletin gives full details, specifications and prices.

Write for Details!

Lovejoy
TOOL COMPANY, INC.
128 MAIN ST., SPRINGFIELD, VERMONT

wastes time, but is hard on departmental morale. The thing to do is to find the employee in each department who is best qualified to teach new men "the ropes," and to make it his responsibility to do so. This man will not necessarily be the best mechanic on the floor, for many splendid mechanics are notably poor teachers.

Apprentice-training departments are faced with the necessity for changing their curriculum if and as new techniques are developed in the plant, or as new equipment and machines are installed. It is difficult to keep a curriculum fully abreast of all new developments. This is all taken care of automatically when new employees are ushered directly in and trained in departments where they are to work. Instruction in such cases inevitably must be carried out with specific reference to techniques then employed and equipment then on the floor, though such techniques or equipment may have been adopted or installed as late as yesterday.

John E. Huyler
Peoria, Ill.

•

THERE ARE three methods commonly used in training apprentices, but I believe that the system used where I served my time is the most profitable.

Apprentices were taken on trial for three months. If at the end of that period they showed that they were the right type of boy, industrous, with a liking for the trade and an aptitude for it, they were signed up for a full apprenticeship.

The plant was run on the working charge-hand system. The plant would have a piece work contract with, say, $500 for the contract price. the apprentice was given a master card, and all the time consumed on that job was entered on the card. The less time consumed the more bonus for everybody. So all of the older fellows made it their business to coach and help along the apprentice. And the charge-hand, who was a crackerjack machinist, spent as much time as possible with him. It was not long then that the apprentice was able to take on and machine some of the more difficult pieces, thus becoming all the time more valuable not only to the gang in general but to the employer.

Yes, there was a proportion of spoiled work, but this gang price work system cut-down spoiled work till it was negligible If you spoiled a job by carelessness the charge-hand would give you a tongue lash-

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BOOSTS PRODUCTION
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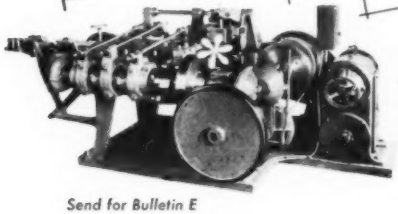
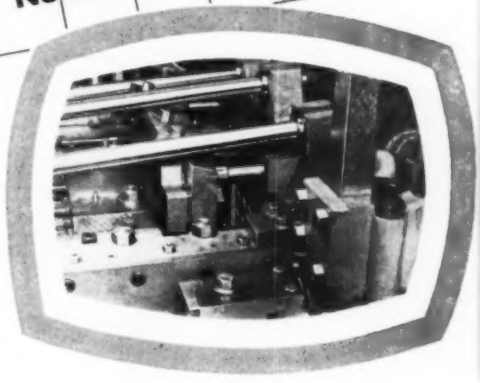
★STRAIGHTEN ★PIERCE ★STAMP ★SWAGE ★FORM ★CUT

ALL IN ONE OPERATION

No Secondary Handling





Send for Bulletin E

The elimination of secondary operations, inspections, and handlings can REDUCE your extra production costs. The Nilson 4-slide machine creates substantial savings by producing uniformly and at close tolerances a COMPLETED PART WITH EACH AND EVERY STROKE!

The illustrated machine has capacity for material up to 2½ inches wide, wire up to ¼ inch diameter and a feed length up to 15 inches.

Other Nilson Equipment

- Automatic Wire and Metal Forming Machines
- Wire Straightening Equipment
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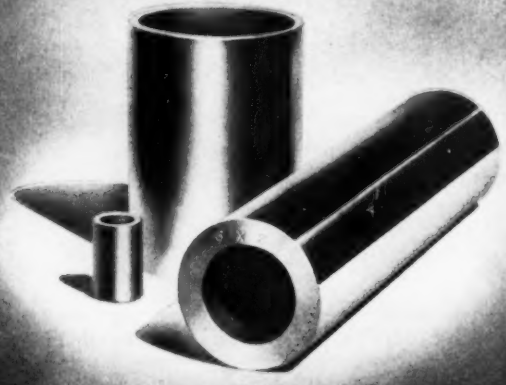


BARS • BEARINGS • BUSHINGS

ing and then show you what you should have done and how by demonstrating to you. You seldom made the same mistake twice.

Under this system you were regularly moved around. Through lathe, milling, drill, grinding, layout and assembly. In lots of cases, apprentices who had three years' tuition were entrusted with the same class of work as the fully experienced machinist.

The apprentice system in another large plant was entirely different. Boys were distributed all around the plant, each boy came under the direct supervision of the shop foreman. Also there was an apprentice boss, responsible for all aprrentices in the plant. Although he did not take a working or active part in their training, he would visit all the boys most every day and inquire if they had any grievance or request to make of any kind, such as a change of shop or work. He would also talk to the foreman regularly to find out how each boy was making out. Each boy was moved periodically from one department to another to learn all the different skills of the trade.

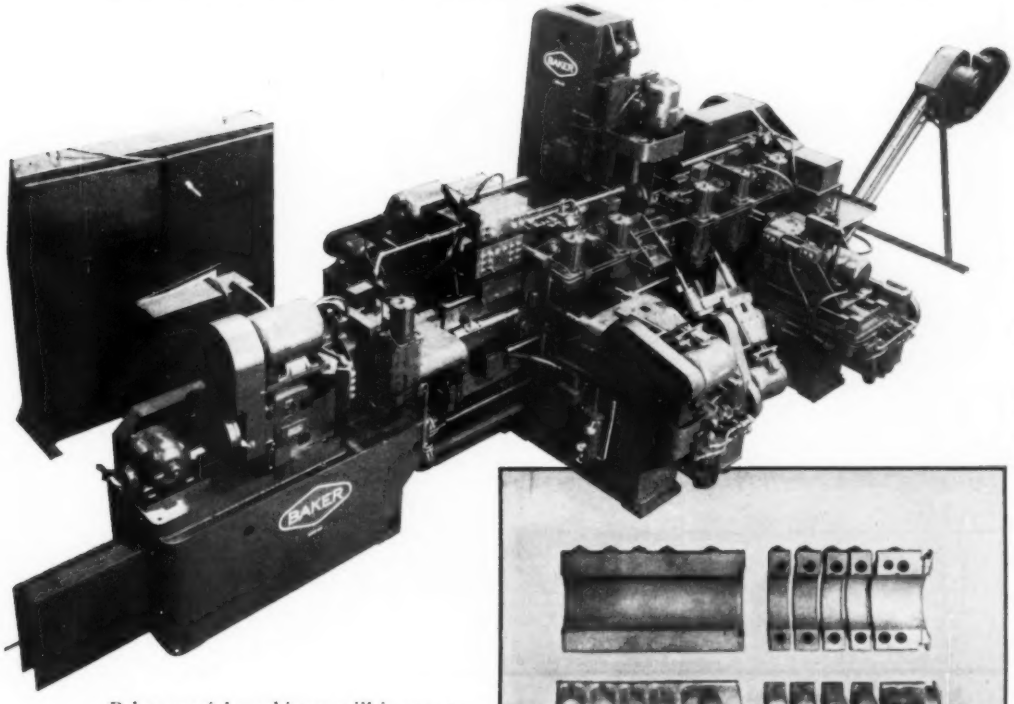
I don't see how this method can compare to the working charge-hand and the gang, in getting a thorough training, because often a foreman would have around 25 to 30 machinists as well as half a dozen apprentices to be responsible for. He had not enough time that he could give to each one individual. Their program was slow, and certainly not so thorough.

A number of larger plants run an apprentice system as follows: The

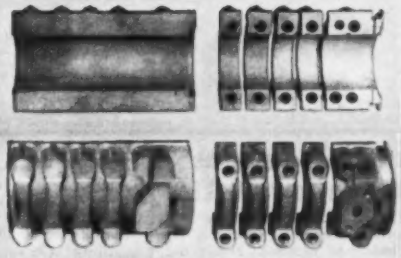
"Better watch that machine—it'll tie you in knots!"

Another BAKER

TIME SAVING...
COST SAVING...MULTI-OPERATION MACHINE



Baker special machinery will increase productivity... cut production costs per man hour. During these times requiring maximum efficiency at every point of manufacture, Baker special machinery will help you fill the orders, at *lower cost per part.* Consult Baker engineers regarding your specific job problems.



Baker multi-operation transfer type machine developed for machining of integral cast main bearing caps; operations include milling of gasket groove for the oil pan... stud hole drilling, as well as auxiliary drilled and tapped holes... milling of lock notches... final operation of parting or separating the individual caps at the last station of the transfer machine through the use of a gang type milling unit. (See parts above) Machine utilizes Baker Outside Hydraulic Power Pack Unit.

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Errors made at the scale stay wrong forever. There is no chance to recheck; either the material has been shipped or has lost its identity in the general stock. You've got to be *right*–weigh it with Toledo Printweigh!

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TOLEDO
All the Way

Check runaway costs—review your scale situation *now!* Have you up-to-date scales—or inefficient "old-timers"? Have you enough scales to cover all steps in materials handling? Do you need Printweigh to stop losses through human errors? Do you have special problems in weighing, checking, testing, counting, batching or force-measuring . . . there's a modern Toledo to do a better job . . . *speedy, accurate cost control!* Send for weight control bulletin 2020.

Toledo Scale Company, Toledo 1, Ohio
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apprentice boss and one or two crackerjack machinists are located in a shop by themselves, this shop being self-contained with all the different types of machinist tools—all the different cutting tools, a very full line of chucks and gages. In fact, every facility to enable them to turn out efficient apprentices. They used up scrap ends and also faulty castings and other pieces for the boys to practice on. They also generally repaired their own machines and equipment. Some of the more advanced boys were allowed to do small lots of production parts. These boys, as they begin to get efficient were placed out in the shop. The various shop foremen inform the apprentice supervisor that they can use one of his advanced boys.

Apprentices are advanced from shop to shop, so that they get a pretty thorough training on all the different types of work and equipment, through all layout and assembly work. During all their apprenticeship, they are supervised by the apprentice boss. Although they come under the direct supervision of the foreman of the gang they are working with, the apprentice boss is responsible for arranging, for change from one activity to another, and for putting in raises in wages.

Arthur Sylvester
Niantic, Conn.

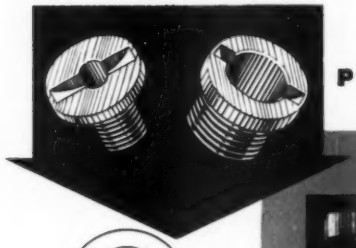
•

WHOSE BUSINESS

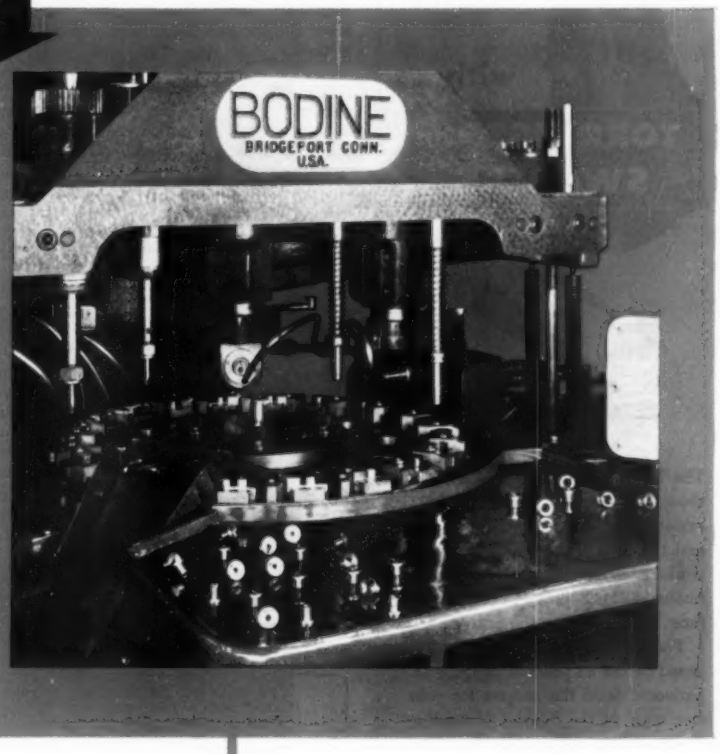
THE efforts of all, from boss downward will, or should, be directed to that end and unified by their common needs although, clearly, these will vary in their nature and degree. Surely it is a simple proposition that capital, in the form of finance, plant, management, and labor, being provided by the different units, continue to make up the production team. The best results will be obtained when each member of the team pulls his weight and all pull together, and he is a good captain who can secure these results. It would be wise to treat all members of the team in such a way that each could feel that he belonged. To give all the sugar; all the inducement to one or two and to the rest the whip or the closed book is likely to induce neither loyalty nor good will and this, added to lack of such information as to the possibility of regular or continued work, will be likely to send men in search of other jobs. This is not in any employer's interest.

For a firm to treat its labor staff with a certain measure of trust, de-

Bodine CASE HISTORY NO. 27

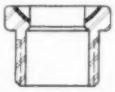


PROCESSING 2 STEEL THREADED BUSHINGS



1. Hand load blanks to dial.

2. Automatically clamp (air cylinders).



3. Mill radial slot .100 wide x ⅛" deep to close tolerances.

4. Ream and c'sink .385 dia. hole.

5. Automatically unclamp (air cylinders).

6. Automatically eject.

PRODUCTION:

This Bodine No. 42-30 automatic dial type Milling and Drilling Machine is equipped with 2 fully adjustable ball bearing Milling Spindles and 2 adjustable ball bearing Drilling Spindles. Machine tooled to produce 2 similar components (as above) per stroke . . . 36 pieces per minute. If you can use Bodine machines, you'll be protected from competition.

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improve surface

end stock waste

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cency, will be to make them friendly, and men of the best type will respond. Men of the other type will not respond and, whether such be boss or workman, does not much matter; but firms of the other type, who do not trusct their workmen, who consider them merely as hands; a kind of superior type of slave, without the right or capacity of speech, will find they will reap that which they have sown. The thought that labor is a kind of partnership, junior of course, is worthy of thought.

P. E. James
Lindum, England

•

IT IS good business to let the men in the shop know what new orders are coming in. Orders are the life-blood of the organization and their measure is also the measure of the success of the company. Unquestionably, concern for the success of the company is necessarily the concern of the men and management.

The intelligent worker of today knows what the score is; he understands that the boss has difficulties and problems as well as he does. He also realizes that the solution of these difficulties and problems affecting the success of the firm is everybody's job. A human enterprise can be successful only if employees and employer work together in a spirit of mutual confidence and understanding.

When enlightened management takes its employees into its confidence and treats them as people, it sets the stage for teamwork from which everyone profits. However, management treatment of employees in countless instances in the past must have been based on a concept of personnel as something besides people. Specifically what, is not clear.

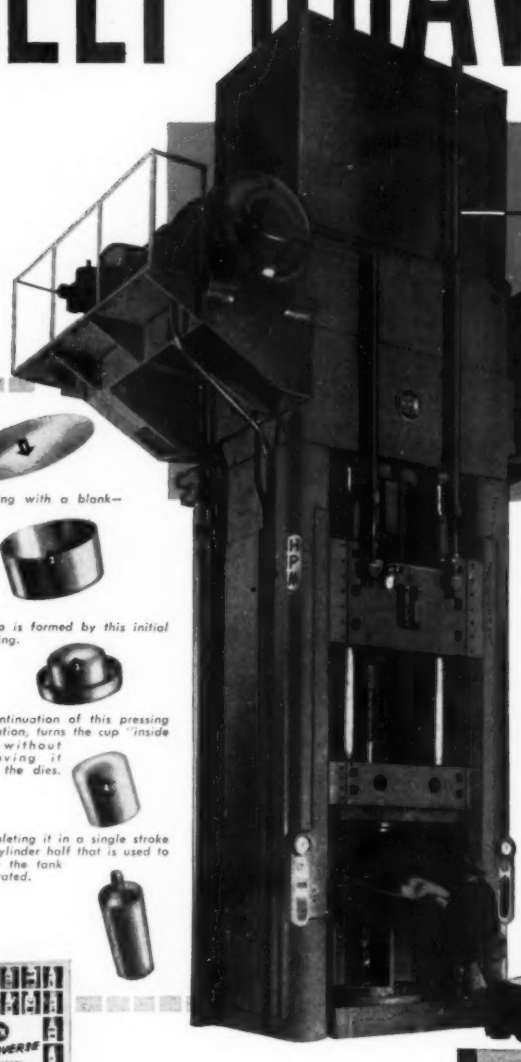
I have heard a story, which is said to have factual basis, of the hard-boiled head of a large shop. This tough old-timer passed through the shop one day and saw a boy lounging against a post—just whistling. The big boss asked him how much he got a week. "Five dollars," the boy replied, "Then here's a week's pay," the boss exclaimed. "Take it and get out!" When the boy was gone, the boss sought out the head of that particular section and demanded to know when the boy had been hired. "We didn't hire him," was the timid reply. "He was just here to pick up a package!" This example shows us a case in which personnel was not regarded as people. It indicates a type of employer-employee relationship that is on the way out.

It is prerequisite to better employee-management relations when the employee knows what new orders are coming in. He can think and act better at his job when he knows the company will be able to provide steady work that will assure security for himself and his family. Employees should be shown that their security is related to that of the company.

By letting the workers know what new orders are coming in, management is indirectly permitting employee participation in the business. It is good for morale when manage-

IT TOOK ME THREE HOURS TO GET THAT JOB SET UP—NOW LOOK WOT Y'DONE TO IT! IT'S CARELESS GUYS LIKE YOU THAT MAKE IT BAD FOR PRODUCTION SCHEDULES
I BET TH' BOSS WON'T LIKE THIS ONE LITTLE BIT
HE MUSTA HAD SOMETHIN' HEAVY IN HIS OVERALL POCKETS TO THROW A HEAVY MACHINE LIKE THAT ONE OFF BALANCE!
"SHOP SYMPATHY"

DEEP DRAWS?



. . . this H-P-M press reverse draws a 40" diameter blank to a depth of 26" in a single stroke!

Starting with a blank—

A cup is formed by this initial drawing.

A continuation of this pressing operation, turns the cup "inside out" without removing it from the dies.

Completing it in a single stroke —a cylinder half that is used to make the tank illustrated.

And incidentally, saves time and money for the Scaife Company of Oakmont, Pennsylvania, in their manufacture of formed steel pressure tanks and vessels. Reverse drawing has eliminated intermediate dies, extra annealing ovens, and repetitive handling of parts in the presses . . . parts are uniform in thickness and quality with a reduced number of rejects. The all-hydraulic 750-ton H-P-M press handles these parts at the rate of 100-140 pieces per hour.

It is this versatile operation—wide range of speeds and control—automatic cycle—FASTRAVERSE "closed circuit" hydraulic power system—low scrap loss—top operating economies that makes H-P-M the top choice of metal-working men everywhere. Find out what H-P-Ms can do on your production problems by calling an H-P-M engineer today.

Send for a free copy of Bulletin 5005 which completely explains H-P-M FASTRAVERSE Press operations and features—and also describes "special application" H-P-M Presses.

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ment communicates this sense of participation to its employees. With truth on its side, and good foremen interpreting the facts, the management story can be carried over to the workers so that they are willing to go ahead without snatching for every last nickel due to the influx of new orders. It is important that employees be given the company financial picture in terms they can understand. New orders and earnings should be included as well as the amount of earnings reinvested in the business to create more jobs and services. Employees should be shown how they profit along with the company when all work together as a team. Dissemination by management of such information to its employees indicates sincerity and respect on the part of management in its relations with its workers. The employee has the right to know what is going on. The interest and responsibility of the company does not end with safety devices on the machinery, a place to work, and a pay check. When management trusts and respects its workers, the respect is justified and higher production results. When management regards personnel simply as part of the equipment for production, the result is trouble.

Some stuffed shirts say that all this information is none of the employees' business. I disagree. If you don't give them correct information, they will pick up misinformation. Correct information is better for the company and the employees. Management should explain to the employees that they, by the techniques they use in the workshop, can reduce unit cost so that the company can make sales and profit out of which the employees will benefit. Management and labor should try to bring back some of that relationship we used to enjoy in the firm of 50 years ago when the employee used to kick the boss's door open and say: "Joe, I just discovered a way to do this job simpler and better. Want to have a look?" And the boss went out and considered the idea. And the employee didn't say: "How much am I goir.g to get for this?" He was part of the team and wanted to do his part.

Harry Kaufman
Philadelphia

•

SHOT IN THE ARM

ED'S NOTION of jacking men up would have been O.K. back in the nineties, but, today, men are better educated, are better trained in particular lines of work and the many operations required, than they ever have been.

This is because more men are specialists. We have lathe hands, milling machine hands, planer hands, etc. These men may know various ways to do work on particular machines, but put them on other machines and other work and they are lost.

A foreman of many years experience made the remark that there are three ways to get work out of men: first and best was to jolly it out of them; second, drive it out of them; third, scare it out of them.

Of course, if Ed has a lot of dopes working for him, they will swallow such stuff as a reprimand, and think that they are fortunate in having jobs, but, today, if men produce the proper amount of work, they "stand on their own feet", and neither Ed nor anybody can step on their self-respect or their pride in their tasks.

F. H. Stebbins
Worcester, N. Y.

•

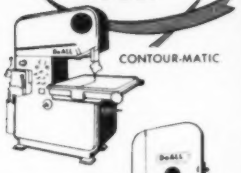
I ONCE knew a foreman who fancied himself to be an ideal boss. He believed he was scrupulously fair. Once a week he would get out a little black book, walk down the aisles of his shop, and as he passed the various workers, make mysterious notations in his book. He believed that this weekly reckoning kept his men on their toes. This was his way of administering a hypothetical "shot in the arm." Actually, the sight of that little black book congealed the men with anxiety and hampered their work. They spoke of this foreman bitterly as their "snoopervisor."

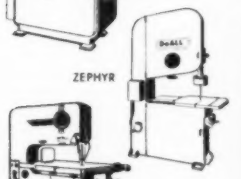
The "little black book" method for making subordinates toe the mark eventually backfired on the foreman. Not only did the quality and quantity of his outfit's work slip, but morale fell to an all-time low. The Big Boss soon made this foreman realize that being a good supervisor was not just a matter of arbitrarily making workers toe the mark. The foreman was failing to get the best effort out of his people because of his lack of understanding of one of the basic principles of good foremanship: understanding that his men were as human as anybody else and if they were treated as persons they would respond by giving their best.

A "shot in the arm" is only a temporary stimulant. What is needed to keep the workers on their toes is a more permanent method of stimulating interest and morale. The mature foreman has the means in his own hands to achieve the sort of stimulation that spells high productivity and decreased costs in his shop. This type of foreman knows that random

DoALL

INDUSTRY'S NEW SET OF TOOLS


CONTOUR-MATIC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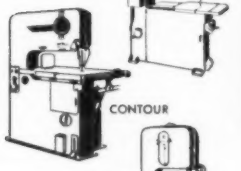
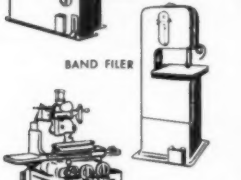
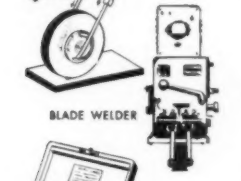

CONTOUR


BAND FILER

TOOLROOM GRINDER

CRUSH GRINDER

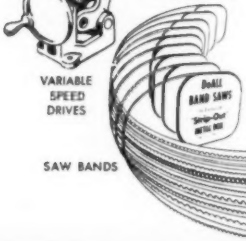
"COOL GRINDING" ATTACHMENT

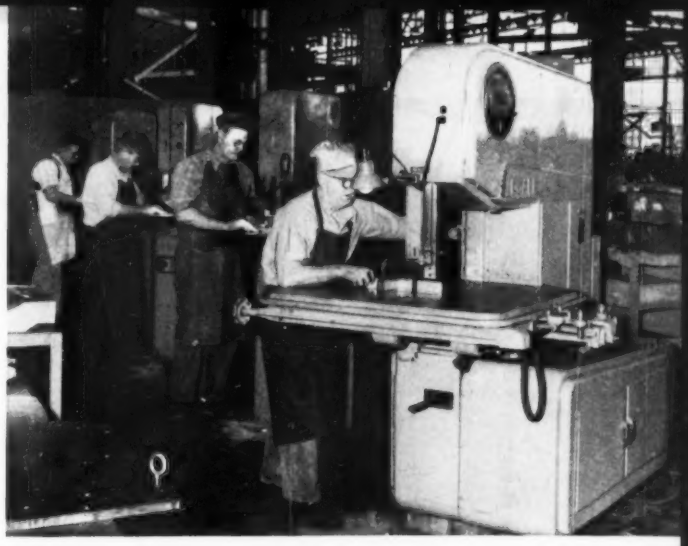

BLADE WELDER

GAGE BLOCKS

GAGE ACCESSORIES

VARIABLE SPEED DRIVES


SAW BANDS



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Alloys
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Castings
Fiberboard
Rubber
Cloth
Books
Paper
Glass
China
Ceramics
Asbestos
Duralumin
Magnesium
Tungsten
Brass
Lead
Granite
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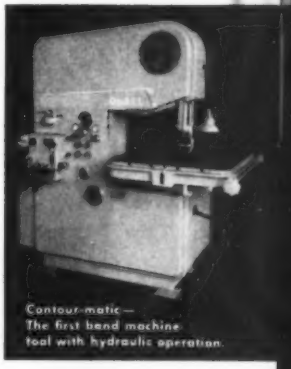
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The first band machine tool with hydraulic operation.

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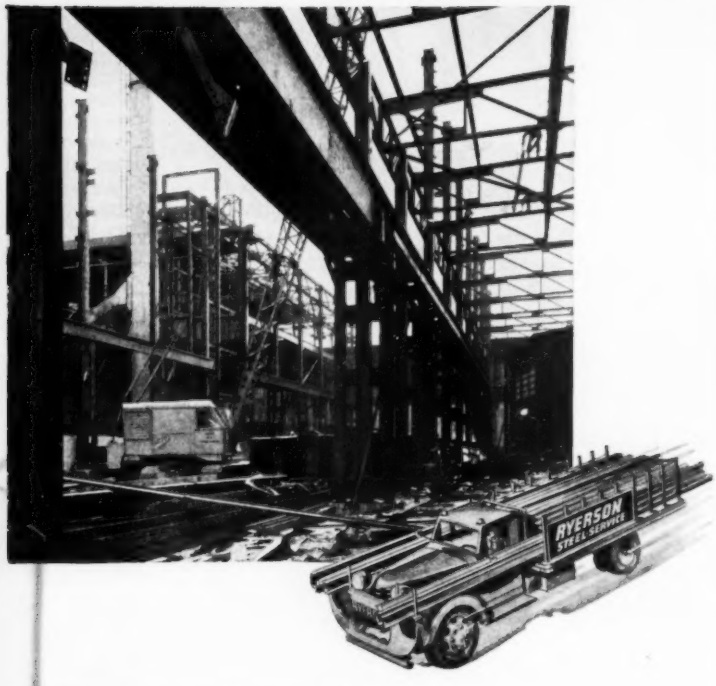

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As you know, the requirements of national defense, plus peak civilian demand now make it impossible for us to take care of many requirements —much as we would like to. And there's little that we can do to change this situation at the moment.

But we are spending millions of dollars on new plants and equipment in order to be better prepared for the day when we'll again be able to furnish all the steel you need, when you need it. Meanwhile, call us—we'll help you to the limit of our ability.

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jolts are unnessary when he is open and above-board with his men in their short-comings, and when he is tactful and diplomatic in correcting their deficiencies. In his daily contacts with his men, the efficient foreman takes time and effort to make the workers feel they are part of the company and that it is not "dangerous" for them to express their honest opinions.

In his daily contact with his men, when the foreman finds that correction is needed, he should tell the errant worker what is wrong and why. He should make a clear and simple statement of the error and explain why it is one. He certainly should give the worker a chance to comment. The foreman should instruct the worker how to make the correction and eliminate the possibility of repetition of the error. The supervisor should end his discussion on an encouraging note for the way he ends up pretty much influences the mood he leaves the worker in. Such a peremptory ending as, "That's the way I want you to do it, and see that it's done that way," isn't likely to make the worker turn back to his job with much enthusiasm. But such concluding remarks as, "I'm sure you will be able to keep going in fine style from now on," or, "You've got it down pat now," are pretty certain to clinch the acceptance of the foreman's correction.

In his relations with his workers, the foreman must be a diplomat. A diplomat is a man who has learned that you can't bend a nail by hitting it squarely on the head.

Harry Kaufman
Philadelphia

NEW BOOKS

TOOL ENGINEERING—*By Lawrence E. Doyle, Ass't Prof. of Mechanical Engineering, University of Illinois. Published by Prentice-Hall, Inc., 70 Fifth Ave., New York, N. Y. 500 pages. Price $6.35.*

Here is a book of real practical value to the graduate engineer who desires to engage in tool engineering, and to the shop man or toolmaker who has a thorough knowledge of industrial practice but lacks the academic knowledge necessary to qualify him as a tool engineer.

After analyzing the nature and scope of tool engineering, the author explains the fundamentals of eco-

don't let mold munch on man hours!

Aspergillus magnified 78X

Are you using Dowicides to reduce production delays and material waste through soluble oils going "sour"?

Discolorations, offensive odor, emulsion breakdowns and oil separation in soluble oil emulsions—these are evidences that bacteria and mold are growing in the emulsion. Because the Dowicides are available in both oil and water-soluble types, they are ideally suited to incorporation with these oils and emulsions as protection against micro-organisms.

Increasing service life of soluble oils by protection against micro-organisms with Dowicides means more economical plant operation. Rusting of machines and parts being machined is held to a minimum. Clogging of piping and screens is reduced, less oil is used. Substantial savings in machine down-time and man hours are effected through less frequent clean-up of machines and piping and mixing of new emulsions.

If you are not already profiting from the added protection which Dowicides give, investigate this accepted means of bringing microbial control into your plant today.

Dow maintains complete laboratory facilities to help you solve your problems. Contact your nearest sales office or write direct to Midland for additional information on Dowicides.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Atlanta • Cleveland • Detroit
Chicago • St. Louis • Houston • San Francisco • Los Angeles • Seattle
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use

DOWICIDE

Industrial

Germicides and Fungicides

DOW

CHEMICALS

INDISPENSABLE TO INDUSTRY AND AGRICULTURE

TIPS
ON MACHINING Stainless Steel
for Higher Production AT LOWER COST
Page B-3
AUSTENITIC STAINLESS STEELS (Cont.)
WIDE VARIANCE IN MACHINABILITY
Types such as 303 are considered free-machining 18-8 grades, while various other 18-8 grades such as types 321 and 347 are extremely difficult to machine. These latter types are especially serviceable at elevated temperatures and will be found to be used frequently for aircraft parts, particularly jet engine parts where extremely high heat may be encountered, and high strength is essential.
CUTTING FLUIDS FOR AUSTENITIC STAINLESS STEELS
DATA!
For the machining of all grades of stainless steel the presence of active or effective sulphur in the cutting fluid in varying amounts is vitally important as this quality tends to reduce the work-hardening characteristics and tendency of these materials to pick-up and weld to tool surfaces.
It should be pointed out that the severity of the machine operation has a direct bearing on cutting fluid application. Operations such as tapping, threading and broaching where slower speeds and heavier cuts are usually in evidence, require a cutting fluid high in active sulphur and factors of lubricity.
Generally speaking, however, the free-machining grades of austenitic stainless steel demand a balanced amount of active sulphur while types such as 347 require the maximum possible amount to prevent chip weld and provide smooth finishes.
STUART'S ThredKut 99
FOR STAINLESS
PROOF!
A Wisconsin manufacturer recently tried twelve different heavy duty cutting fluids for the tapping of type 310 stainless steel. One of the oils that failed sold for 45c per pound. Production with the best of these products amounted to 50 holes per tap. With Stuart's THREDKUT 99, production was increased to 550 holes per tap.
D.A. Stuart Oil CO.
2729 S. Troy Street, Chicago 23, Illinois

nomics, and shows how various kinds of costs involved in production are obtained and distributed. The problems of economy found in tool engineering are thoroughly explored, and methods of planning and tooling for maximum economy are explained. Planning and estimating, principles of dimensioning, and selection of processes are considered, together with detailed explanations of the principles of locating work in fixtures. Fundamentals of tool design, with particular emphasis on tool efficiency, methods of work clamping, and a careful explanation of dimensional analysis are also included.

Each chapter is complete with a short summary of its contents and a group of questions designed to test the student's grasp of the subject.

•

F. B. I. REGISTER OF BRITISH MANUFACTURERS (23RD EDITION)—*Published by Kelly's Directories Ltd., and Iliffe & Sons, Ltd., Dorset House, Stamford St., London, S.E. 1. 852 pages. 9½ x 7½ in. Price 42 shillings.*

For those interested in purchasing British goods or services, this unusual directory provides a substantial cross-section of the most important producers in a wide range of industry. Major instructions are given in English, French, and Spanish.

The book includes a classified buyer's guide with more than 5000 alphabetical trade headings, an alphabetical directory of member firms with address, telegraphic address, phone number, list of products, home and overseas branches and agencies, a list of trade associations, brands and trade names, and trade marks. Also included is a comprehensive advertising section in color.

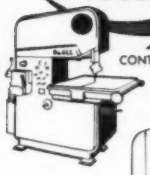
•

STANDARD METAL DIRECTORY (12TH EDITION)—*Published by Atlas Publishing Co., Inc., 425 W. 25th St., New York, N. Y., 818 pages. Price $15.*

Completely revised since the last edition, this directory is a goldmine of information for the purchasing agent and manufacturer requiring authentic data on metal producers. It contains detailed reports on 10,000 steel mills, foundries, smelters, rolling mills and nonferrous metal plants in the United States and Canada. These are arranged alphabetically and by geographic location,

DoALL

INDUSTRY'S NEW SET OF TOOLS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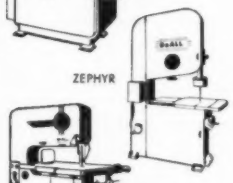
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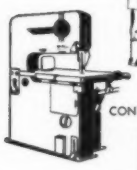
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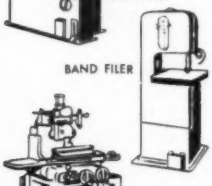
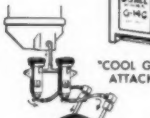
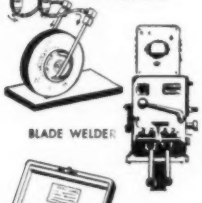

BAND FILER

TOOLROOM GRINDER

CRUSH GRINDER


"COOL GRINDING" ATTACHMENT

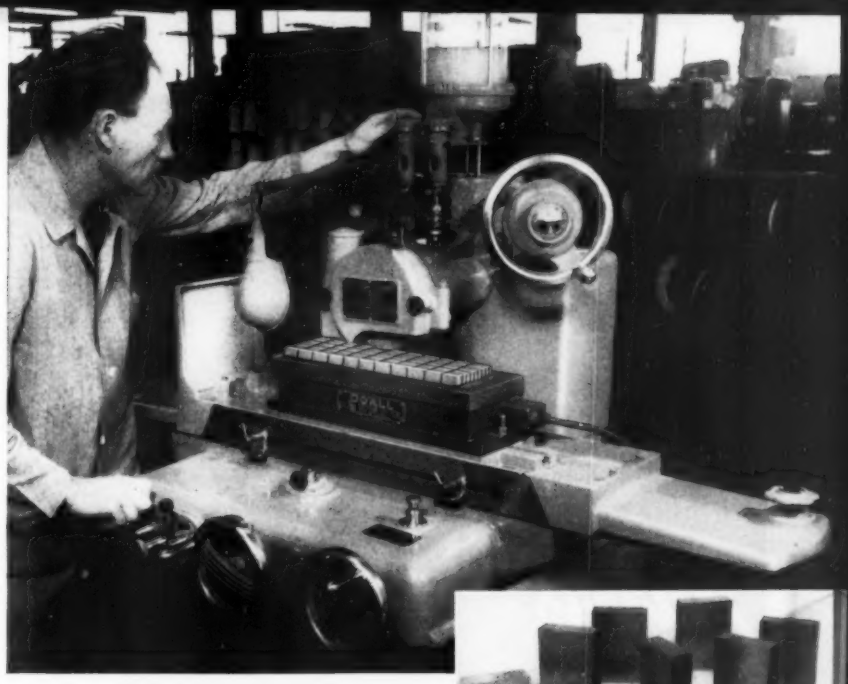

BLADE WELDER

GAGE BLOCKS

GAGE ACCESSORIES

VARIABLE SPEED DRIVES

SAW BANDS

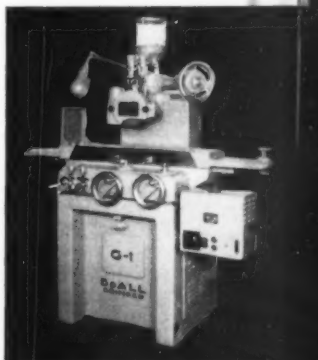


IMPOSSIBLE?

It's easy with a DoALL SURFACE GRINDER!

Problem: Grind a chuck-load of gage block blanks, flat and parallel to .0001" leaving .0001" for lapping. Surface finish must be .000007" RMS or better.

Solution: Use any DoALL Precision Surface Grinder, with "Cool Grinding."



"Cool Grinding" on the DoALL Super Precision Grinder (7 models available).

Precision Grinding is one of the first steps in the production of DoALL Gage Blocks. DoALL Grinders have inherent rigidity, plus a fine spindle and smooth operation that make it possible to finish grind with cuts as deep as .025".

DoALL "Cool Grinding" adds to wheel life and prevents burning of the work.

Let us show you, through actual demonstration, how DoALL Surface Grinders can save you time and money. Write for complete information today.

TOOL STEEL

BENCH FILER

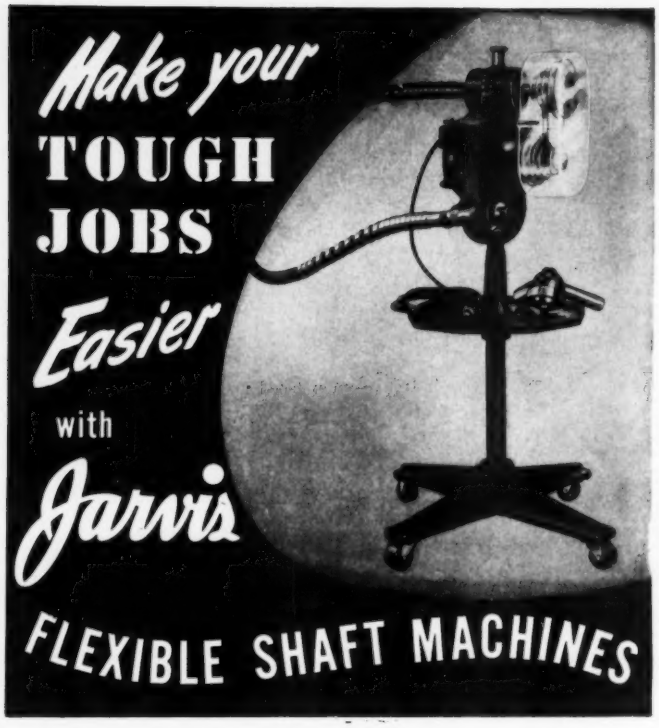
The **DoALL** Company

Des Plaines, Ill., U.S.A.

Cable Address: DoALL, Des Plaines

DoALL Stores In Key Cities

Factory Trained Representatives Everywhere



Dependable Jarvis Flexible Shaft Machines make your *tough* jobs easier — do them faster and more economically. Made to meet your individual requirements for grinding, cutting, buffing and many other operations, Jarvis Flexible Shaft Machines are available in bench, floor or overhead types — single or multiple speeds. Factory trained Jarvis representatives are ready to help you select the machines best suited to *your* own applications.

Long-lived Jarvis Rotary Files, depended upon the world over, are available in many shapes and flutings. For detailed information on Jarvis Flexible Shaft Machines and Rotary Files, write to The Charles L. Jarvis Company, Middletown, Conn.

Jarvis POWER TOOLS

TAPPING ATTACHMENTS
TECNI-TAPS and DIES
ROTARY FILES
FLEXIBLE SHAFTS and MACHINES
QUICK CHANGE CHUCKS and COLLETS

THE CHARLES L. JARVIS CO., MIDDLETOWN IN CONNECTICUT

and give the company name, capitalization, equipment available, products, primary and secondary raw materials consumed, and names of company officers, purchasing agent and sales manager.

In addition to all this, there are lists of distributors of all kinds of metals, forging and stamping plants, metal-powder producers, galvanizing plants, dealers in used and scrap metals, importers and exporters, and hydraulic-press operators.

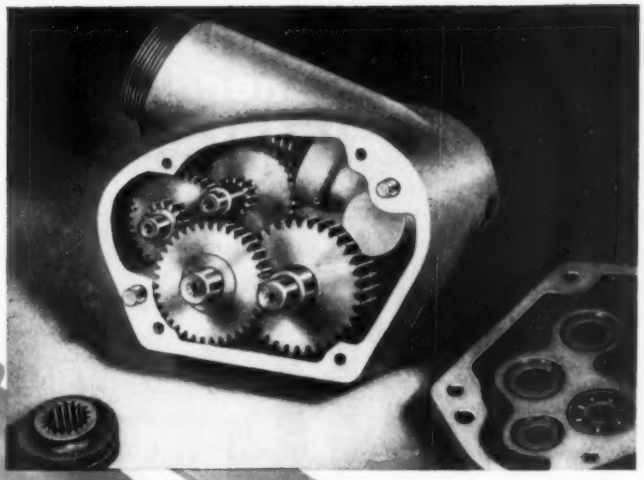
Lack of Information Breeds Discontent

By JOHN HOMEWOOD, Ontario, Calif.

THERE ARE two extremes of thought in industrial relations: one is "What I do in my business is none of labor's business," the other is that business is successful only when all elements synchronize harmoniously. This can obtain only when both labor and management are aware of the needs and interests of each other.

I recall a case in which the management of a small firm was of the former type. Through the grapevine the men in the shop were aware of the prices asked for some of the small parts they made. Naturally they got their heads together and decided that the boss was

"Darling, how could you do this to me? You know I'm production control manager!"



ACME STEEL Specifies "G.S." For Better Small Gearing

The Acme Steel Pneumatic Steelstrap Stretcher is designed and precision-built for years of rugged service. It keeps on working year after year with never a thought by hard-handed shippers for the intricate mechanism inside! The uniform accuracy of G. S. Fractional Horsepower Gearing contributes greatly to the staunch superiority of the Acme Steelstrap Stretcher.

Producing Small Gears in large quantities, to exacting specifications, is our highly developed specialty. You see, we've been doing this ONE JOB very successfully for over 30 years! Here, we've gathered together the world's finest facilities for mass producing Gearing from 12 to 96 D. P. with almost uncanny economy and efficiency. The very next time you have a problem in which Small Gears are involved by all means submit it to our capable engineers. See for yourself why so many of America's leading manufacturers depend upon G. S. for *all* the Small Gears they need!

Send for Free New

6-page folder which illustrates and describes G.S. facilities, Small Gearing and applications together with handy charts for those who specify Gearing from 12 to 96 D. P. and finer. Will you ask for it on company stationery, please?

FRACTIONAL HORSEPOWER GEARING

GEAR Specialties, Inc.

Spurs • Spirals • Helicals • Bevels • Internals • Worm Gearing • Racks • Thread Grinding

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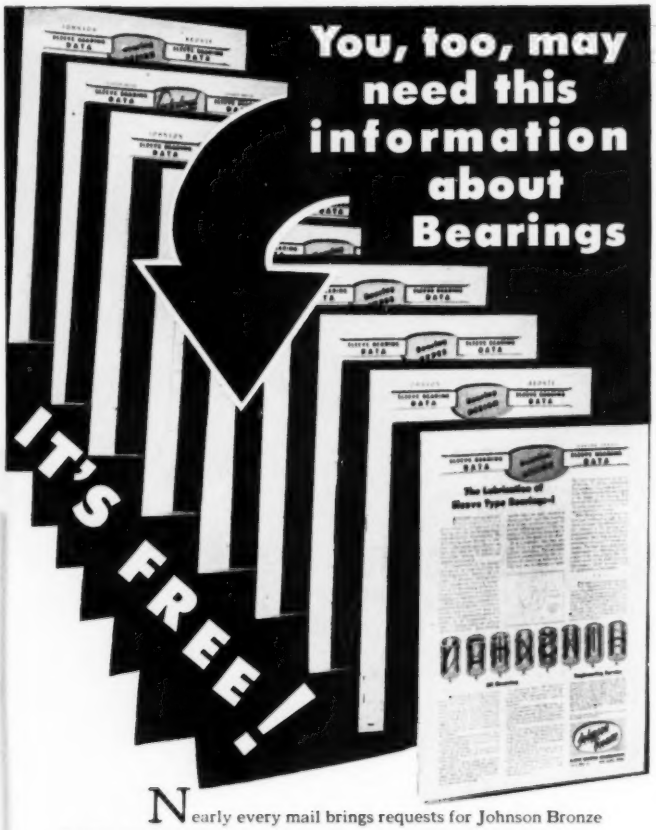
2635 WEST MEDILL AVENUE • CHICAGO 47, ILLINOIS

WORLD'S LARGEST EXCLUSIVE MANUFACTURERS OF FRACTIONAL HORSEPOWER GEARS



Nearly every mail brings requests for Johnson Bronze DATA SHEETS. This has been going on for over a year now. Men in industry who use bearings and engineers who design products using bearings are anxious to get the facts about them. These data sheets cover bearing types, bearing design, materials, powder metallurgy, tolerances, tests, lubrication, etc. They are written by engineers and research men, giving plain facts. These data sheets are printed on 8½ x 11 inch sheets for your convenience in filing. There are twenty sheets available now . . . more to come.

Johnson Bronze
SLEEVE BEARING HEADQUARTERS
515 SOUTH MILL STREET • NEW CASTLE, PA.

making an ungodly profit on one small piece—forgetting overhead and the many dollars lost in unprofitable experiments.

"Look, Bill, here we work our heads off turning these things out by the hundreds in no time at all and—well, look for yourself—here it is," said one, flipping over a couple of pages of a price catalog.

"Boy!" replied, "If they can ask that for one of those, they must be making a killing on these." Chances are he pointed out a part on which the cost was above the selling price. Misunderstandings and discontent certainly could result under such conditions.

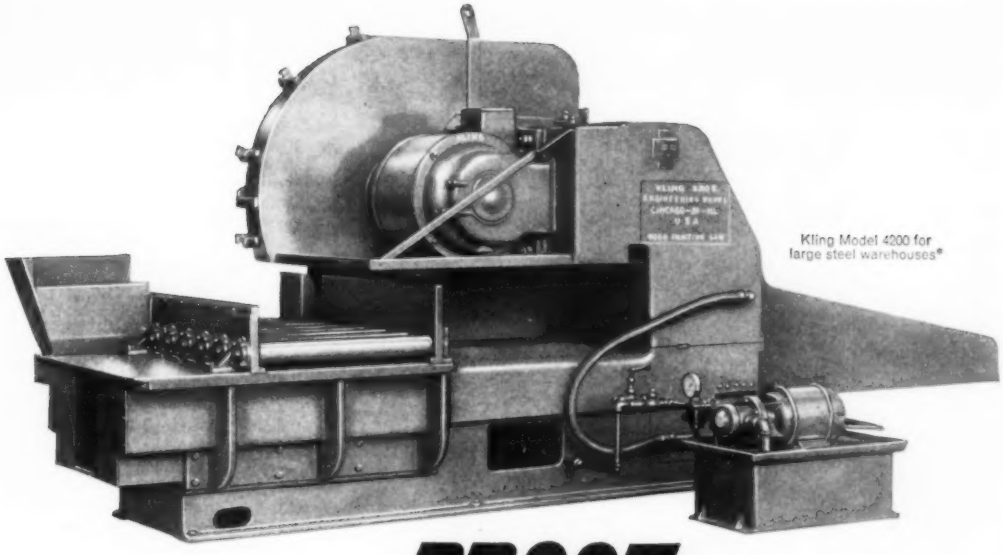
Another case is of a large concern which took its employees into its confidence and opened the books, so to speak, for all to see. In addition to the usual directors, junior directors were selected from employees worthy of fair thinking. Throughout the plant stewards heard from the men direct and passed the information on to the head office. Everything was wide open and the employees knew conditions from every angle. If an order was obtained on which there was likelihood of loss, the men did everything necessary to bring the production up to the highest possible efficiency. If a good profit was made, the men were rewarded to correspond. While other firms were going to the wall, this "broad-minded" plant ran to capacity.

Today, the head man of the plant can guard against his employees becoming contaminated with wrong ideas, by following policies progressive enough to counteract the forces of industrial subversion.

Old Plants Can Be Efficient

"It's NOT THE AGE of the building but the technological methods employed that really determine the modernity of any plant," said Leo J. Pantas, works manager of the Salem Division, The Yale & Towne Manufacturing Co., in a recent address before the Society of Industrial Packaging and Materials Handling Engineers.

Pointing out that productivity must be increased if the nation is to carry both the civilian and military burden, Pantas urged greater mechanization of handling operations as a major step in solving the problem: "One might say that the obvious course to



Kling Model 4200 for large steel warehouses*

PROOF that you can

do it faster with KLING high speed friction saws

What is friction sawing?

It's a proven method of cutting metal by generating heat through friction on the part to be cut at a rate faster than that part can absorb heat. This temperature increase reduces the tensile strength of the piece to the point that the weakened surface can no longer resist the action of the colder blade. The metal is thus easily removed with no apparent wear on the blade surface.

Fastest, all-around cut-off machine in the shop!

Cuts all types of steel, hard or soft, big or small, in any shape, without distortion. For day-in, day-out production, one Kling Friction Saw will do the volume of work that would ordinarily require several separate shears or slow speed saws. One of the big time-saving reasons is the ability of the Kling Friction Saw to cut any structural shape, without change of blade or setup. Because the average Friction Saw blade will give a good full day's production before requiring redressing, you eliminate costly downtime and also save on tool costs.

FREE complete, friction sawing information!

Learn how you can profitably apply Kling Friction Sawing in your plant. The information contained in this 12-page bulletin will give you the complete story on Friction Sawing . . . including the principles of the process and some of its applications. Write today for your FREE copy.

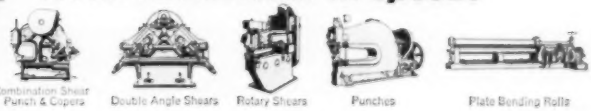
KLING BROS. ENGINEERING WORKS
1300 N. Kostner Ave. • Chicago 51, Illinois

How long would it take you to cut these pieces?		With a Kling friction saw you could do it in approximately . . .
24" 100 lb. I Beam	⊢⊣	28 seconds
15" 55 lb. Channel	⊏	15 seconds
8"x8"x34.3 lb. H Beam	H	10 seconds
100 lb. A.R.A. Rail	I	9 seconds
6-1/2"x6-1/2"x19.8 lb. Tee	T	5 seconds
8"x8"x3/4" Angle	∧	11 seconds
3" Square	■	10 seconds
4" Round	●	15 seconds
6" O.D. Tube, 1/2" Wall	○	11 seconds

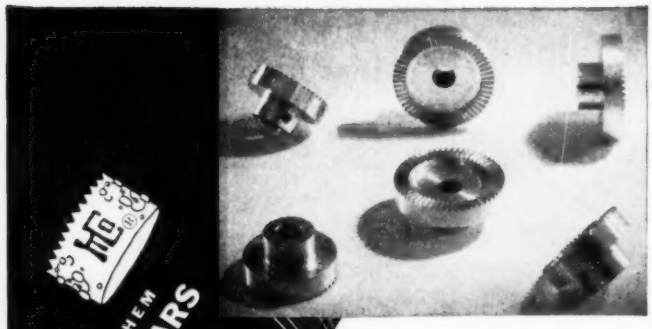
5391

*What's your requirement? There's a size to fit your specific needs—large or small.

Kling ...an investment in speed!



Combination Shear Punch & Cipets | Double Angle Shears | Rotary Shears | Punches | Plate Bending Rolls



SOME CALL THEM
CROWN GEARS
SOME CALL THEM
FACE GEARS

But all gear manufacturers agree that accuracy in a gear of this type is most difficult to achieve.

THE HAMILTON NO. 1
PRECISION GEAR HOBBER

ACHIEVES ACCURACY

CROWN GEARS, formed on this machine, will be found to have perfect contact on the pitch line throughout the entire length of the tooth.

FILE THESE FACTS - - - IN YOUR MEMORY

The Hamilton No. 1 Gear Hobber forms small, super-accurate spur, spiral, bevel, worm, and face gears. It is of extra rigid construction, and embodies the **unique feature of independent selection of speed, feed, and indexing.**

Thus—the principle of this machine (hobbing) eliminates the possibility of indexing error. The accuracy of this machine is reckoned to .0002". The rigidity of this machine *maintains* accuracy and encourages heavy production loads. The principle of independent speed, feed, and indexing selection, embodied in this machine, cuts set-up time far below previously acknowledged minimums, and permits higher production on relatively soft materials without indexing change.

We will be glad to supply engineering information about the application of the Hamilton No. 1 machine to your particular job. **Also ask for our Bulletin H 1-49. It illustrates and explains the Hamilton No. 1 Gear Hobber in detail.**

DEALERSHIPS are still available in eight territories. Write for information.

THE Hamilton TOOL COMPANY
830 SO. NINTH STREET • HAMILTON • OHIO • U • S • A

follow to attain expanded output would be to build new, streamlined plants with ingenious mechanized assembly lines. Unfortunately, not only is there little time, but there's also a growing shortage of building materials and other scarcities which, together with the present shortage of investment capital, preclude the immediate construction of many necessary few plants. Of the open choices, one practical solution, then, is to work with existing plant facilities so as to bring them up to their production peak.

"By recurring demonstrations, it has been shown time and again that handling of all sorts is the 'soft underbelly' of production, the sphere of greatest vulnerability in cost and efficiency, the weakest link in the production process. On the other hand, it has been shown, with equal force, that it is in the sphere of handling that industry can make almost incredible progress in reducing cost, in increasing unit output per man-hour, and in vitalizing over-all production efficiency.

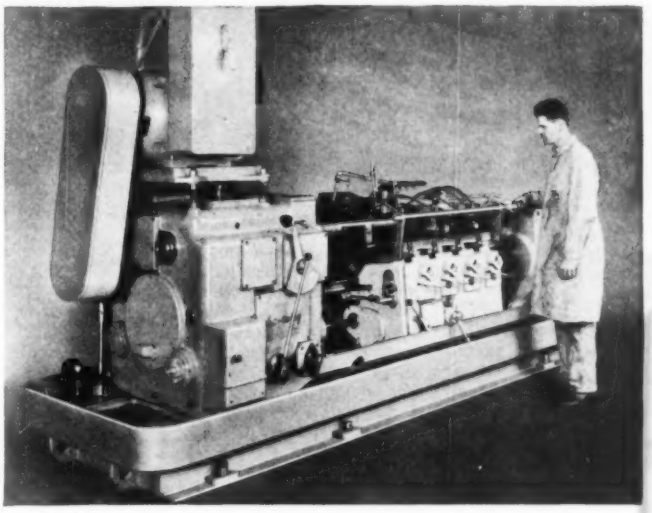
"The recently completed Census of Manufactures discloses that 72% of all industrial buildings in the United States are over 25 years old. Of these, half are from 35 to 45 years old, another quarter are over 45 years old. This plethora of aging American plants underscores the scope of the problem we are here to discuss today. Old plants and buildings are more likely than not to pose complications which, at first glance, seem to exclude efficient manufacturing. While they may require a very different approach from a new plant, ideally systematized with modern mechanized handling, I believe a combination of engineering ingenuity and imagination, abetted by some modern mechanized materials handling equipment and techniques, can often make a more efficient operating unit of even the oldest plant."

"tch tch — this your first time around machinery? and last?"

MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK

MODEL "AP" Lo-swing LATHE MACHINES ELECTRIC MOTOR SHAFTS



Problem: To rough turn, face shoulders and groove electric motor shafts machined in small and medium size quantities.

Solution: This new Lo-swing Semi-Automatic Lathe, featuring *unlimited length of carriage travel thru rack and balanced twin pinion carriage feed*, is ideal for machining short and medium run jobs economically. Unlimited carriage travel permits turning of short run jobs having long shoulder lengths with simplified tooling; multiple tooling may be used for long run jobs with short or long shoulder lengths.

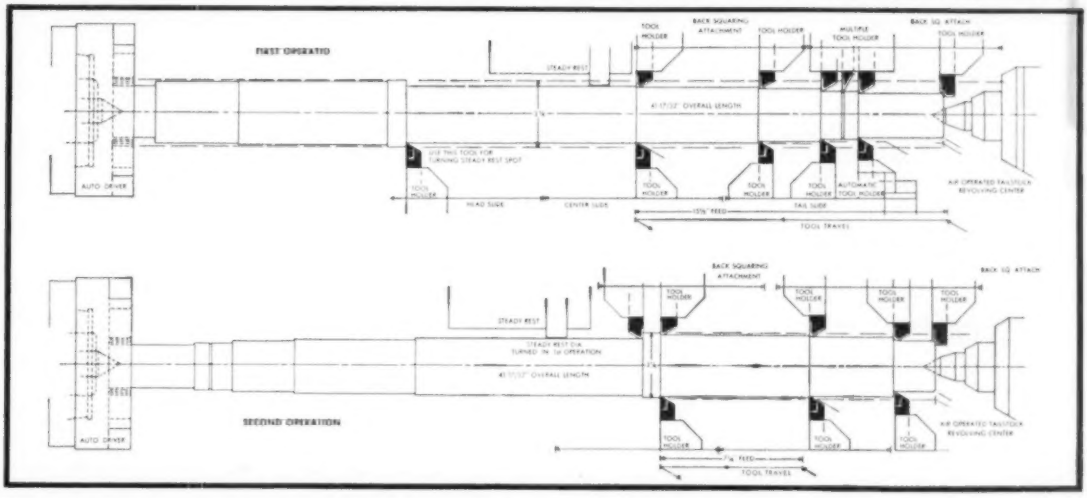
The drawings below show a typical two operation tool setup on electric motor shafts which are being machined in small lots. Only the one tool is being used for turning each diameter regardless of the length of cut.

Machine setup is simplicity itself. First, the tool blocks and tools are mounted on the tool slides in the proper relation to each other and for the proper depth of cut. Secondly, two stops are set for controlling length of carriage travel in both directions and one stop for positioning the carriage in relation to the work piece. The lathe is then ready for production.

Tool relief is automatic on the return stroke of the carriage and rapid traverse movements to and from the work are available by throwing a lever.

Investigate the many unique features of this new semi-automatic lathe.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.



PRODUCTION COSTS ARE LOWER WITH Lo-swing

SAVE MOUNTING COSTS
INCREASE PRODUCTION RUNS

WITH FACTORY ASSEMBLED
AND INSPECTED DIE SETS

FACTORY-BUILT IS BETTER-BUILT

YOU are sure of built-in precision when you specify "DETROIT" die sets. Quality-built to start, every set is *assembled and inspected* at the "DETROIT" factory, where *complete* testing facilities are available. Precision standards are constantly maintained to enable mounting of die in die set in less time, and to obtain longer trouble-free production runs without necessity of regrinding. Phone nearest "DETROIT" representative for prompt delivery from factory.

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PITTSBURGH . Perrysville	4-5111
ROCK ISLAND, ILL.	R.I. 8-2814
ST. LOUIS	FR 6811
ST. PAUL	CE 1600
SAN FRANCISCO	EX 2-7018
SEATTLE	MU 2450
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TORONTO, CAN.	PL 3813
WICHITA	5-8682
WINDSOR, CAN.	2-1575

DETROIT DIE SET CORPORATION
2895 W. GRAND BLVD. • DETROIT 2, MICH.

DETROIT DIE SET ★

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On or about ..... my new address will be:

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City ..... Postal Zone # ..... State .....

Signed .....

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From The *American Machinist* Library of *Tips for Top Shop Men*

IT'S one thing to hate red tape and paper work, another to do without them. Some of each is necessary, the first to give people time to think, the second to protect you against people who can't.

REMEMBER that your employees' need for recognition is a *continuing* appetite—just the same as their need for food. A morsel once every six months won't satisfy either one.

Wade®

No. 7
HAND SCREW MACHINE

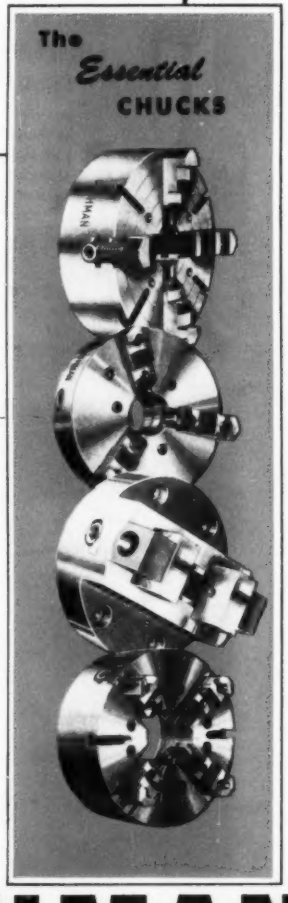
. . . for modern, fast, economical production of second-operation work. All rotating parts are "Dynetrically" balanced for vibrationless operation at all speeds. Quick-acting collet closer allows swift and almost effortless chucking and removal of work.

7" swing Spindle speeds, 315 to 3300 RPM
1" collet with superior characteristics
4-to-1 Hi-Lo Speeds at finger tips
Spindle stops without stopping motor

Send for Catalog

THE WADE TOOL CO., 53 River St., Waltham, Mass.

When did You Last make a CHUCK SURVEY?



Unless your key production machine tools are properly equipped with the right chucks and jaws . . . in perfect condition . . . and tested for centering accuracy . . . you will inevitably face production delays and high rejects.

We suggest a comprehensive and careful chuck survey of your plant right now. Check the condition and age of chucks and jaw sets. . .

Check the chucks on hand for each tool against possible new working demands. Check your supplies of soft blank jaws and standard jaws in required sizes and types. Then make up your new chuck equipment orders on a scheduled delivery basis and get them through to us or your distributor immediately. By doing this you will avoid many delays and help us to help you meet urgent production demands.

THE CUSHMAN CHUCK CO.
HARTFORD 2, CONN.

CUSHMAN CHUCKS

A World Standard for Precision

SC951

Ready Solutions To Your Everyday Welding Problems

THE WELDING ENCYCLOPEDIA

The enlarged, authoritative twelfth edition of THE WELDING ENCYCLOPEDIA marshals every fact and every rule—every bit of the reliable guidance you need in:

—handling any welding jobs, simple or complex.

—selecting the right materials and equipment for your job.

—answering your everyday welding questions.

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THE WELDING ENCYCLOPEDIA
330 West 42nd Street, New York 18, N. Y.

Mail me the 12th edition of THE WELDING ENCYCLOPEDIA. I enclose check ☐ money order ☐ for $6.50 to cover cost of book and mailing charges

Name .....

Title .....

Company .....

Address .....

A Look at the SPECIFICATIONS SHOWS YOU WHY THIS DRILL CAN REALLY PRODUCE!

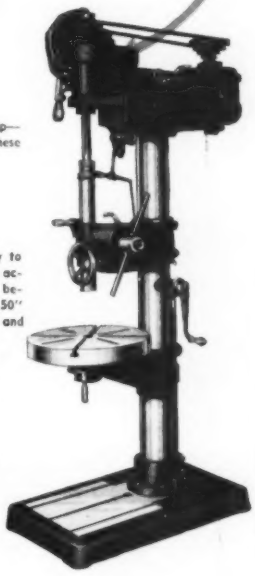
Today's tight shop schedules call for drills that can stand up—like the "Buffalo" No. 22 Round Column Drill shown. These specifications show why:

COLUMN DIAMETER—(steel)	5.5"
SPINDLE—LEAST DIAMETER	1.312"
HEIGHT (spindle raised)	94"
DRILL CAPACITY (cast iron)	2"

Spindle runs smoothly on ball bearings and is held tightly to avoid deflection—for long, accurate use. Maximum space between spindle nose and the 19.50" O.D. working table is 27½", and you can drill to the center of a 22" circle. WRITE FOR BULLETIN 2989-F for further facts on these drills.

"BUFFALO" HAS THE DRILL FOR YOU!

Starting with the No. 14 high-precision drill for up to ⅜" holes, "Buffalo" builds 9 different types of drills to suit every requirement, on up to the big "RPMster" with 1000 instantly changed speeds. WRITE US ABOUT YOUR TYPE OF OPERATION, and we'll mail you applicable bulletins.



"Buffalo"

BUFFALO FORGE COMPANY

509 Broadway Buffalo, New York

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING CUTTING SHEARING BENDING

From the *American Machinist* Library of *Tips for Top Shop Men*

THE more a man has to be told what to do, the less he's worth.

SUPERIOR people are uncommon. It's your job to take average people and get them to do superior work.

TELL your men what the company is doing—but beware of telling too much. The things most people want to know about are none of their business.

AN OPEN mind is an asset only if it can be closed for action after the whole question has been considered and a decision made.

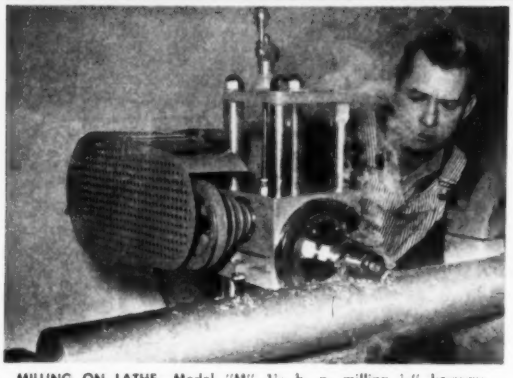
EXPECT men to have complaints. It's human nature, and besides, reforms come only from below. No man with four aces yells for a new deal.

AN OLD country saying is "Them that can brag *without lying*—let 'em brag." Remember the "lying" part particularly.

NEW MASTER MILLING ATTACHMENTS

FOR PRODUCTION – TOOL ROOM – EXPERIMENTAL AND MAINTENANCE SHOPS

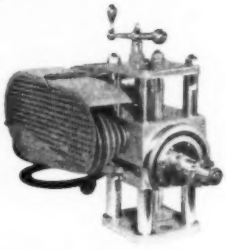
MODELS–FEATURES



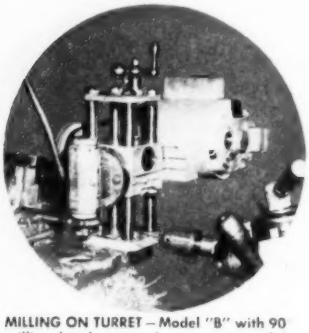
MILLING ON LATHE – Model "M" 1½ h. p. milling ½" keyway one foot per minute.

ON LATHES TURRETS AND MILLING MACHINES

Master MACHINE TOOLS



BASIC MILLING UNIT

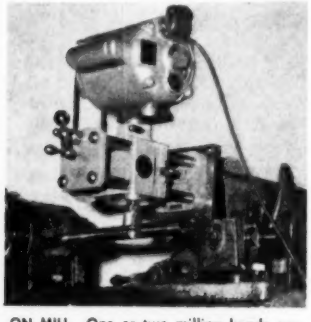


MILLING ON TURRET – Model "B" with 90 milling head mounted on rear cross-slide for keyways, slots, cross milling – completing part in turret.

3 SIZES • CAPACITIES

Model "C" – ⅓ h. p. motor – 9" to 13" swing lathes
Model "B" – ½ or ¾ h. p. motor – 14" to 18" swing lathes
Model "M" – 1 or 1½ h. p. motor – 18" to 72" swing lathes

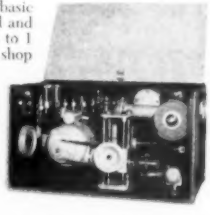
The Master Lathe Converter is a precision multi-purpose machine tool attachment adaptable on most all basic shop machines. The basic unit does milling, drilling, boring, and has eight interchangeable heads for milling, drilling, grinding, slotting, keyseating, and indexing. Spindle speeds, 50 to 15,000 rpm. It provides complete machining facilities with minimum equipment investment, produces more operations per set-up thus increasing production of your present equipment, saves work transfer, assures accuracy, is simple and fast to set up. Prime and subcontractors are converting their present equipment for special applications and production with the multi-purpose Master Lathe Converter.



ON MILL – One or two milling heads can be used on post assembly for single or multiple milling cuts. Mounts on overarm for vertical milling or cross-ways for opposed milling head.

COMPLETE SHOP KIT

COMPLETE SHOP KIT – This group of equipment includes basic milling unit, external and internal grinding heads, 90° universal and hi-speed milling heads, slotting or internal keyseating head, 40 to 1 geared dividing head, seven arbors, in a heavy plywood shop cabinet. This kit provides facilities for most all machine shop operations on a lathe at a fraction of the investment required for individual machines, plus wide use on other basic shop machines. Ideal for maintenance and repair, tool room, experimental, mobile units, aboard ship, and production shops.



★ MILLING ★ DRILLING ★ BORING
★ THREAD MILLING ★ GRINDING
★ SLOTTING ★ INDEXING
★ INTERNAL KEYSEATING

WRITE FOR FREE LITERATURE

MASTER MANUFACTURING CO.
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HUTCHINSON, KANSAS U. S. A.

YESTERDAY'S PIONEER . . . TODAY'S LEADER

Weldon

Double-End End Mills

IT'S THE TEETH THAT TELL

It's the "teeth" in Weldon End Mills that tell the story of more production and bigger profits on your jobs.

Weldon pioneered in producing *scientifically designed* teeth for end mills, a step over 25 years ago that opened the door to higher speeds, and faster feeds.

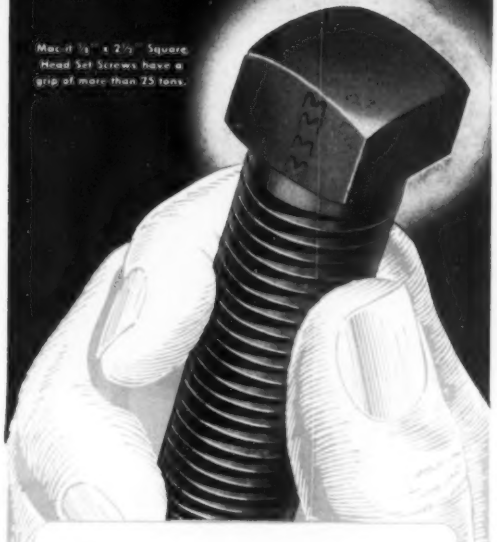
After lengthy experiment and study, the *tooth shape* and *spiral angle* on Weldon End Mills were radically altered from conventional styles. The result was a tooth, that *allows chips to curl out without clogging* and *insures better performance* and *longer life* for the tool.

Call the Weldon representative for more information.

THE WELDON TOOL CO. Cleveland 4, Ohio
3000 WOODHILL ROAD

IT'S A *Mac-it*®
PRONOUNCED "MACK-IT"

Mac-it ⅞" x 2½" Square Head Set Screws have a grip of more than 75 tons.



BETTER, FASTER SERVICE WITH THIS *COMPLETE* MAC-IT LINE!

Because many standard types of Mac-its are stocked throughout the country for quick delivery, and because specials can be engineered to your own specifications, you'll find it pays to investigate Mac-its *first*.

Mac-it's 35 years' experience in the manufacture of heat-treated, alloy steel screws is your assurance of precision, uniformity and strength. Sold through leading industrial distributors from coast to coast and in Canada. Write for new catalog today!

Other Mac-it products include:

- Hollow Lock Screws
- Socket Head Cap Screws
- Hollow Set Screws
- Stripper Bolts
- Hollow Pipe Plugs
- Socket Screw Keys
- Hexagon Head Cap Screws
- . . . and many others

Marketed Nationally Since 1913 by
STRONG, CARLISLE & HAMMOND COMPANY
Cleveland 13, Ohio
Manufactured by MAC-IT PARTS COMPANY, Lancaster, Pa.

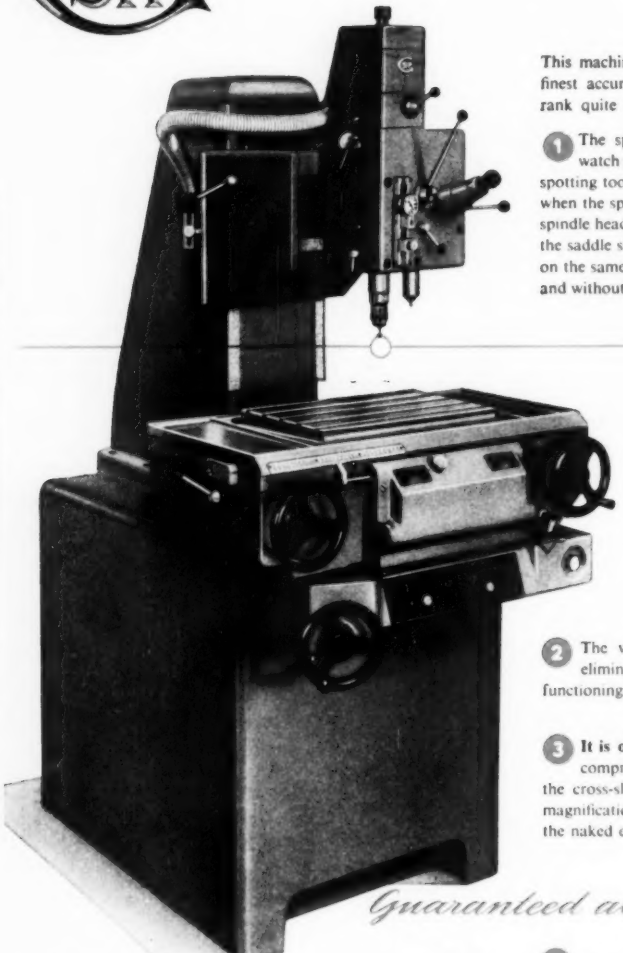
Announcing the new

No. 1H High Precision Jig Borer

with optical settings

on viewing screens

SIP



This machine of new design is intended for boring work of the finest accuracy. It incorporates exclusive features which make it rank quite apart from the jig borers presently built.

1 The spindle head contains the three tools mostly used by watch and instrument makers: the boring spindle, a retractable spotting tool and a locating microscope (which can readily be used when the spotting tool is raised), both having a common axis. The spindle head can occupy two positions determined by abutments on the saddle slide. This permits bringing the three tools alternatively on the same spot of the workpiece by a single turn of a handwheel and without any dismantling.

The latest developments in optical design incorporated in the No. 1H Jig Borer are reflected in the construction of the accompanying PD-1H Optical Circular Dividing Table.

2 The work-table moves on precision guiding rollers which eliminate friction and wear of the ways and assures smooth functioning and accurate positioning.

3 **It is optically set** by means of a patented measuring system comprising two standard scales at right angles housed within the cross-slides and the graduations of which appear at a large magnification **on built-in viewing screens.** Readings are made with the naked eye to .0001 in. They are devoid of any parallax error.

Guaranteed accuracy: .00008 in.

Working range	8" × 8"
Table working surface	16" × 10"
Distance from table top to spindle head	11 3/4"
Spindle speeds	360 to 3000 r.p.m.
Boring capacity	1 9/16" dia.
Spindle quill travel	2 1/8"
Net weight	1900 lbs.

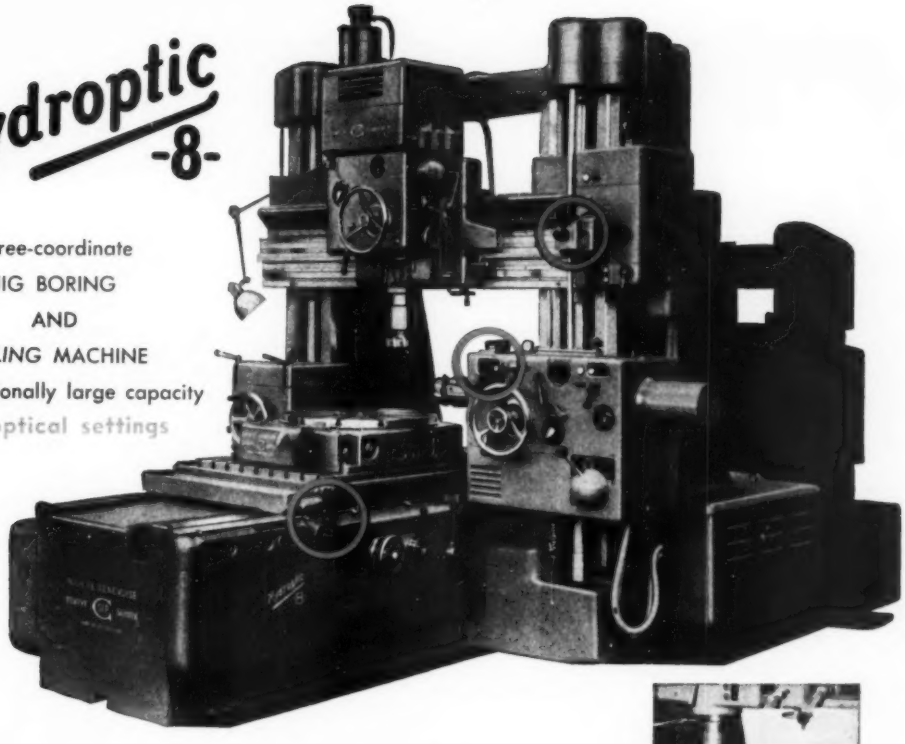
4 The measuring devices are totally enclosed and free from any wear or mechanical strain.

The permanence of accuracy is fully guaranteed.

The standard scales are enclosed in a hermetically sealed space so that the operator has the full assurance that nothing can interfere with the inherent accuracy of the measuring standards.

Hydroptic -8-

Three-coordinate
JIG BORING
AND
MILLING MACHINE
of exceptionally large capacity
with optical settings

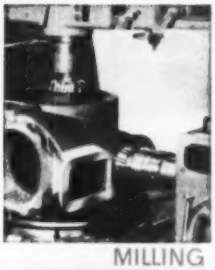


"High performance"

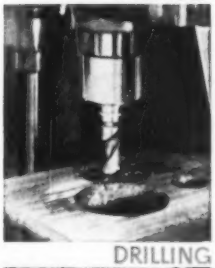
is ensured on this machine built for heavy duty work by exceptionally robust construction throughout, extra-rigid vertical and horizontal spindles running in special SIP reinforced taper roller bearings, wide range of spindle speeds and feeds adapted to fast rates of production, outstanding flexibility of operation due to automatic control of most movements, and hydraulic table drive providing stepless range of milling feeds and rapid traverse motion.

The standard scales

built into the machine and on which settings are made by means of micrometer microscopes are guaranteed accurate to within .00005 in. Fully enclosed and free from wear and mechanical stress, they give full assurance that their inherent accuracy will remain absolutely permanent, whatever the working conditions.



MILLING



DRILLING

BORING

THE LARGEST JIG BORING AND *MILLING* MACHINE EVER BUILT

Table longitudinal travel	55 in.	Vertical spindle speeds	40 to 2000 r.p.m.
Vertical spindle head travel	40 in.	Horizontal spindle speeds	40 to 1000 r.p.m.
Horizontal spindle head travel	28½ in.	Spindle quill travel (both spindles)	12 in.
Distance between uprights	57 in.	Net weight of machine	16 tons

Guaranteed setting accuracy: .0002 in.

AMERICAN SIP CORPORATION

HIGH PRECISION MACHINE TOOLS AND MEASURING EQUIPMENT

100 East 42nd Street NEW YORK 17, N.Y.

New!

SERIES

50

GENERAL PURPOSE MARKING MACHINES

for

- ✓ Marking round surfaces
- ✓ Marking flat surfaces
- ✓ Precision graduating
- ✓ Serial numbering
- ✓ Knurling and embossing

ROLL-O-MARK
All-pneumatic
(Model 50P1) marks
up to 1200 pieces per hour

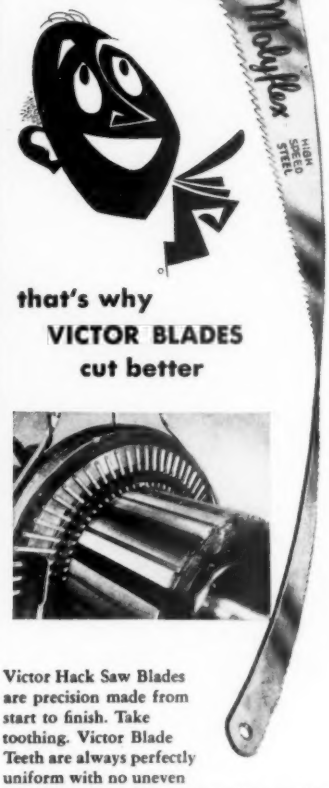
Here is the leader in the all-new Noblewest Series 50 marking machines. The *Roll-O-Mark*—with all-pneumatic operation—marks with greater speed and economy than any other medium priced general purpose marking machine. It employs the original Noblewest *roll-marking* process—producing sharp sunken impressions that will last the lifetime of the piece. Ideally suited for trade marking, part or patent numbering, codifying and serial numbering. Series 50 is also available in semi-pneumatic and manually operated models. Write today for catalog containing full information and specifications. Better still, tell us your specific requirements and we can make complete recommendations. The Noble & Westbrook Manufacturing Co., 17 Westbrook Street, East Hartford 8, Conn.

MARK IT BEST WITH NOBLEWEST IMPROVED MARKING DEVICES

NOBLEWEST

EQUIPMENT FOR MARKING · GRADUATING · EMBOSSING · NUMBERING

PRECISION



that's why
VICTOR BLADES
cut better

Victor Hack Saw Blades are precision made from start to finish. Take toothing. Victor Blade Teeth are always perfectly uniform with no uneven teeth. That's because they're cut by a special machine using scores of *individually* ground toothing tools that are always accurately set. No other manufacturer cuts teeth this way.

There's a Victor Distributor near you, ready to fill your needs promptly. He's also ready to give you ABSOLUTELY FREE copies of the Victor Wall Chart and the Victor Metal Cutting Book. Both are jammed with valuable information. Get yours today.

With *Victor Steelrite Metal Marking Crayons*, you can mark hot, cold, damp or grimy metal *easily*. Withstands pickling and will not affect enamel application.

6546

VICTOR

SAW WORKS, INC., Middletown, N. Y., U. S. A.

Makers of Hand and Power Hack Saw Blades, Frames and Band Saw Blades

QUICK SOLUTION to MANPOWER PROBLEMS

through the *SEARCHLIGHT SECTION* of this publication. The market place for those offering or wanting the services of men on technical and specialized production executives, the *SEARCHLIGHT SECTION* offers a quick, effective solution to your manpower problems. Because its readership is confined to just the type of men you need, waste circulation is avoided—you reach only the men you want.

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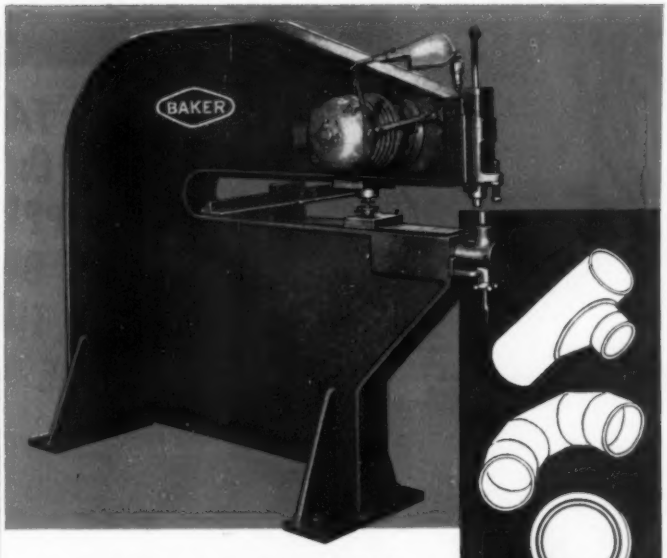


FOR HEAVY DUTY CUTTING IT'S THE BAKER TRU-EDGE SHEAR

CHECK THESE FEATURES:

- **BURR FREE EDGE** no finishing operation necessary
- **EASY TO OPERATE** no starting hole necessary
- **48" THROAT**
- **DOES BEADING AND FORMING**
- **CUTS 10 TO 36 FEET PER MINUTE**
- **ONLY 5 MOVING PARTS**
- **CAPACITY: 6 GAUGE IN MILD STEEL 7 GAUGE IN STAINLESS STEEL**
- **DELIVERY FROM STOCK**
- **COST? . . . $1960.00 F.O.B. TOLEDO**

In actual cases on record, the Baker Tru-Edge Contour Shear cuts operating time to less than 1/10 of the time required on previous machines.

BAKER BROS., Inc. Toledo, Ohio

MAKERS OF BETTER MACHINE TOOLS . . . SINCE 1867

The Tru-Edge Control Shear is made by Baker Bros., Inc., under license from Industrial Devices Corp., Detroit, Mich.

From The *American Machinist* Library of *Tips for Top Shop Men*

STUDY the trends and statistics, and be guided by them—but never forget that your customers, your suppliers and your workers are not statistics, but people.

NO two workers are alike, either in method of working or in temperament. Remember this when you teach methods or attempt discipline.

ADJUSTABLE TAPPING HEAD

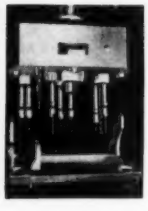
Fully geared. Needle bearings on all spindles in head. Ball thrust bearings throughout. Bronze bushed. Sand cast aluminum case.

ADJUSTABLE DRILLING HEAD

This versatile tool permits you to take advantage of a wide range of adjustment without overhang.

FULLY ADJUSTABLE DRILLING HEAD

Here's a light, compact tool with a wide range of adjustment. Can drill on squares, rectangles, circles, triangles and irregular patterns.



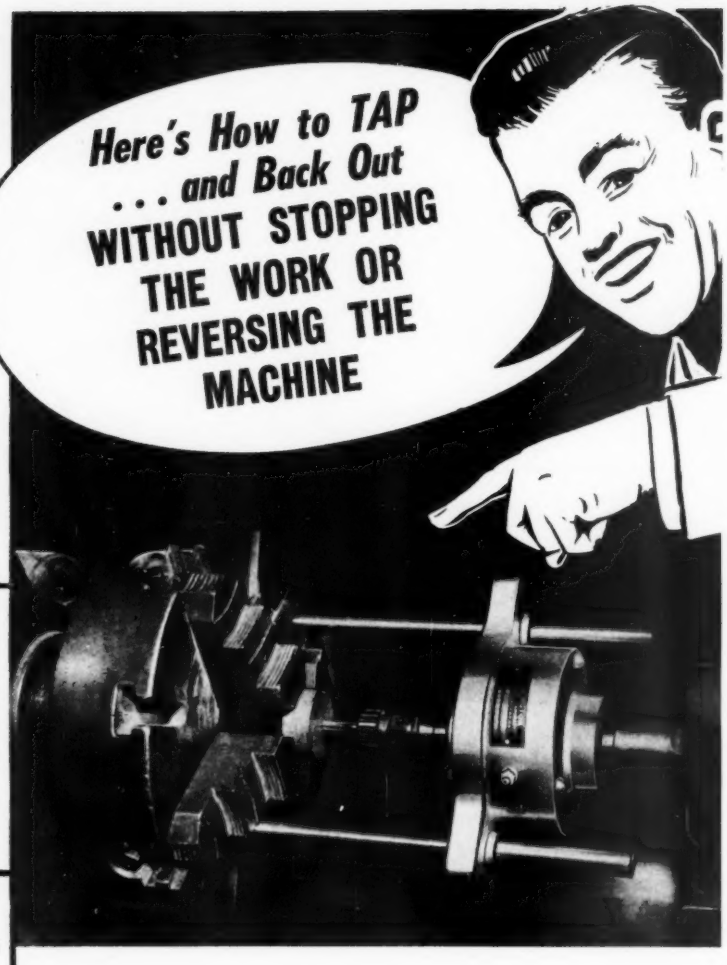
MULTIPLE SPINDLE HEADS

Shown is a ten spindle multiple drilling head, drilling ten varied size holes on different elevations.

AUTO-REVERSE TAPPING CHUCKS

Cut small hole tapping cost with Errington Cone Drive 2 to 1 Auto-Reverse. Ball and bronze bearings throughout. Taps to 3/16" in steel and 1/4" in cast iron. Also with Jacobs Rubber Flex Chucks.

Here's How to TAP . . . and Back Out WITHOUT STOPPING THE WORK OR REVERSING THE MACHINE



The Errington Auto-Reverse Turret Lathe Tapping Head is a new tool, practical, time-saving, money-saving. In a turret lathe setup, as illustrated, it allows you to tap the hole and *back out the tap without stopping the work or reversing the machine.* It's easy to operate: simply feed the tap into, and out of, the drilled hole while the work is turning in the one direction.

The new Tapping Head is a money-saver in this respect, too: with the aid of a friction chuck, you can tap blind holes without any possibility of tap breakage.

An inquiry, based on your production problems, will bring full details, prices and delivery information. There's no obligation.

ERRINGTON AUTO-REVERSE TURRET LATHE TAPPING HEAD

can also be used on drill press work for production-tapping. For this the Errington Head has a 2 to 1 reverse, and uses guide-bars to hold and steady the case.

Write for Complete Information

ERRINGTON MECHANICAL LABORATORY, INC.
Established 1891
Main Office and Plant: STATEN ISLAND 4, N. Y.

Two standard Delta Abrasive-Belt Finishing Machines mounted on one stand provide low-cost tube polishing set-up. Two motors are used — one speed for drive and feed action, one for actual grinding.

Battery of standard Delta 10" tilting-arbor Unisaws used by Consolidated Vultee Air-Craft Corp., San Diego, California to cut aluminum alloy in a wide variety of thin sheets and shapes.

DELTA
MILWAUKEE
®

From the world's most complete line
First in selection!
First in quality!
First in value!

"Designed for wood but "Doubling in Brass"

For many of your non-ferrous metal operations Delta woodworking machines offer quick, low-cost solutions

Don't let habit limit your planning when machines are scarce, time is short, and costs run high! Remember that *standard Delta woodworking machines are often the quickest, best, low-cost solution* for non-ferrous metal cutting, machining, and fabricating. Our files are full of other convincing reports like those shown above. Send for complete details — and plan your jobs around the versatility of dependable Delta tools — high in quality, low in cost! Call on Delta's engineering service help.

Sold only through authorized dealers — available on easy time payments. Look for the name of your Delta dealer under "Tools" in the classified section of your telephone directory.

DELTA POWER TOOL DIVISION
Rockwell
Manufacturing Company
MILWAUKEE 1, WISCONSIN
DELTA • MULTIPLEX • CRESCENT • HOMECRAFT

Delta 10" Tilting Arbor Unisaw

Big table, big cuts — rips stock (wood) 3½" thick, cuts to center of 50" panel. Table size 20" x 27" (27" x 36" with wings). Blade tilts 45° to right. Lubricated-for-life ball-bearings in diamond-bored seats. Other Delta circular saws: 8" Tilting Arbor, and Tilting Table . . . 10" Tilting Table, 12" Tilting-Arbor . . . and 8" to 20" Radial-Arm types. At prices from $69.95 to $930.00.

Free!

6 TIMES A YEAR

The Power Tool Journal — packed with detailed job data, fully illustrated — handbook of time- and money-saving shop ideas!

Tear out this coupon and mail today!

Delta Power Tool Division
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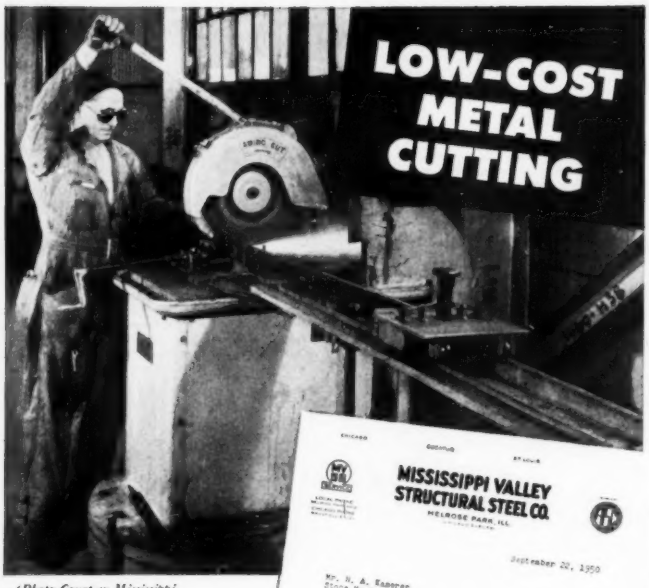


(Photo Courtesy Mississippi Valley Structural Steel Co.)

This progressive fabricator now has six Stone metal cut-off machines in operation.

The Stone Swing-Cut in your shop will cut metals at the rate of 4 seconds per square inch at a cost of approximately 1½ cents per square inch. You can lower your metal-cutting costs — in ferrous or non-ferrous materials — with a Stone Swing-Cut. Write today for further information.

MISSISSIPPI VALLEY STRUCTURAL STEEL CO.
MELROSE PARK, ILL.

September 22, 1950

Mr. H. A. Ranerer
Stone Machine Company
Syracuse, New York

Dear Mr. Ranerer:

We are pleased to report to you that since the purchase of your #10 swing abrasive cut off machine in January of this year, we have had renewable results in both production and costs.

We have been producing considerable quantities of structural steel railing for industrial plants and have found that the cutting time required to accurately cut off this material on our assembly department has been improved five times over our previous methods. Our records show that this machine pays for itself in the first six months of operation.

We feel that we have indeed found a valuable tool for production in this machine and thank you for your cooperation in assisting us in furnishing our needs.

Yours very truly,

W. A. Stuckey
Shop Superintendent

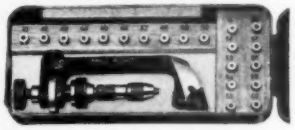
RAS:cp

STONE MACHINERY CO., INC.
300 FAYETTE ST. MANLIUS, NEW YORK

TRUE POINT DRILL SHARPENER

for number drills 41 to 60 and No. 61 to 80

Right and Left Hand.



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Standardize on Veelos—the adjustable v-belt—and *eliminate* the storage problem, the control problem and the "tied-up" money problem that is usual in maintaining a full stock of endless v-belts.

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PREJUDICE is usually blind ignorance. Sooner or later, the man who retains prejudices runs into trouble —and shows his inability to educate himself out of his narrowness.

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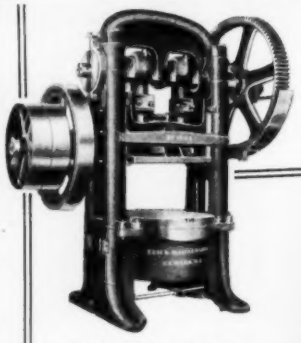
The presses illustrated are Four typical examples of the many different types developed by Z&H. They embody modern features in design and construction to assure the maximum in accuracy, stamina and production economy.



Double Crank Presses

Built in three styles: Pillar or Solid Frame construction . . . 4-25 tons; Gap or Overhanging Frame . . . 25 and 36 tons; Built-Up Construction . . . 50-150 tons.

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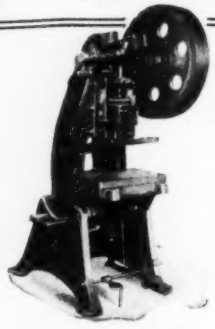
Full details on all types and sizes of Z&H Power Presses available on request.



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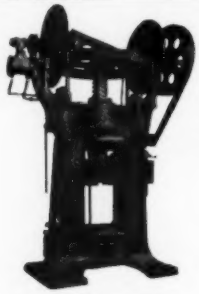
Plain and Back Geared . . . for general stamping. Capacities: 4-100 tons.



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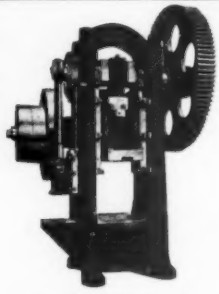
For hot pressing non-ferrous metals, cold pressing steel coining, sizing or striking. Capacities: 25-400 tons.



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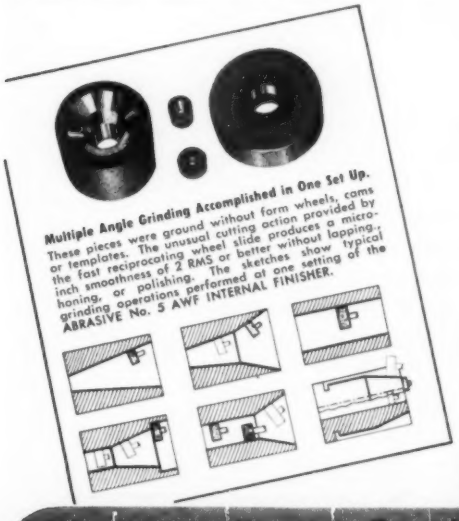

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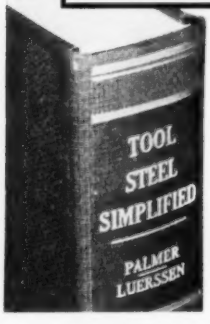
ALL INFORMATION, METHODS, AND IDEAS NEEDED TO PRODUCE BETTER TOOLS AND DIES



Practical Data on Popular Analyses of Tool Steels, their Selection, Heat Treatment, and Use

in the Revised, Enlarged SIXTEENTH PRINTING of this

TOOL and DIE STEEL HANDBOOK

By Palmer and Luerssen

Here's the BOOK OF ANSWERS for every man responsible for tools and dies. Shows you how to increase your company's production from present equipment—how to reduce toolmaking trial and error, conserve tool steel, avoid die troubles, simplify heat treatment. It starts "from the beginning" with *what* tool steels are, their analyses, and why one grade will outperform another on some jobs. Gives complete working information on everything from selection of the right steel to heat treating methods and equipment, hardness and toughness testing, latest data on high speed and hot work steels. 564 pages, 355 charts, photos, diagrams give you facts on: how design affects heat treatment, hardenability tests, time required to heat different tools to required hardening and drawing temperatures, furnace atmospheres, quenching, tempering, trouble-shooting.

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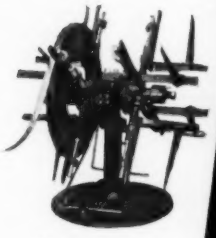

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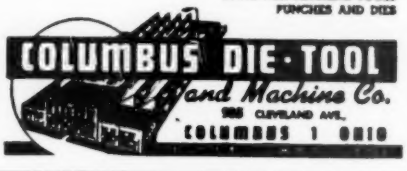

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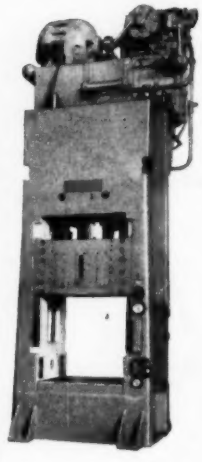
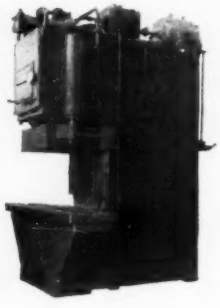
A WILLIAMS - WHITE machine for every forming, punching, shearing, rolling or pressing operation . . . . . .

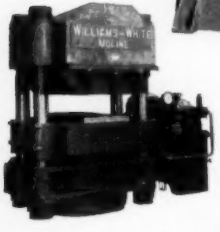


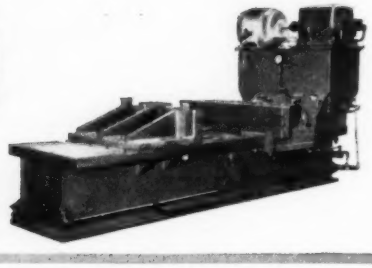
At right: 500-Ton Hydraulic Housing Press: Bed and ram area, 48 x 48 in.; Daylight opening, 54 in.; Stroke, 36 in.; Drawing speed, adjustable; Hydro - pneumatic die cushion.

Below: 500-Ton Hydraulic Gap Frame Press: Platen surface, 24 x 96 in.; Throat, 16 in.; Daylight opening, 30 in.; Stroke, 24 in.



Below: 600-Ton Column Moving Up Hydraulic Press: Platen surface, 42 x 60 in.; Daylight opening, 24 in.; Stroke, 12 in.





At right: 200-Ton Hydraulic Bulldozer, with adjustable end lug. Die space, 36, 48 and 60 in.; Stroke, 24 in. Foot button or treadle control.

THE hydraulic machines shown above are representative of the equipment built by WILLIAMS-WHITE & CO. It is famous all over the world for quality and long service.

When interested in machines similar to the ones illustrated, write us, giving as much information as possible and we will send complete specifications with no obligation on your part.

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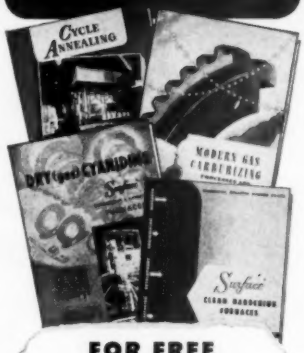
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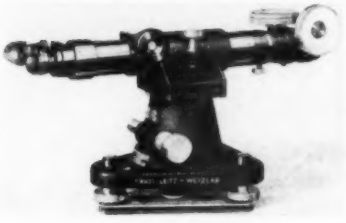
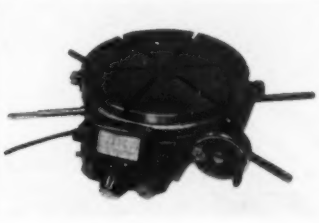


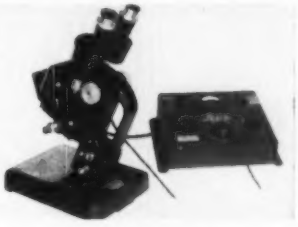
Alignment Telescope

The new Leitz instrument provides a purely optical method of checking alignment of machine tool beds, crank case bearings, shafts, engine bores and testing machine tool ways for straightness. These and other difficult engineering tests are now reduced to a routine operation that is positive and takes but a fraction of the time needed by other than optical methods. Complete instrument comprises a telescope proper, micrometer measuring attachment, leveling stand and target with illuminator.



Optical Circular Table

This unit, the acme of precision in circular tables, provides optical readings independent of worm gears or other wearing, error-creating parts in two second graduations. Designed for use with jig boring machines, toolroom milling machines or wherever highly accurate rotary indexing is required. Scale is projected and can be read over prolonged periods without eye-strain.



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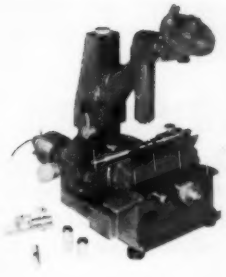
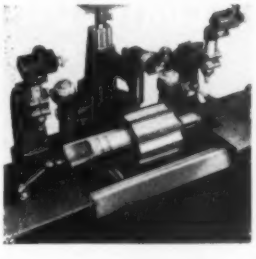


Improved Toolmaker's Microscope

A shop tool with laboratory precision, this Leitz Optical Microscope features the "Intermediate Image" which permits work to be inspected through a wide range of magnification with the same templets. Eliminates scale drawings, and conventional sources of error. A natural size master part may be used as standard for comparison. Can be used for large profiles and work pieces to coordinate dimensions, 4"x1" —Other sizes available.

Small Toolmaker's Microscope

This Leitz Microscope combines scientific laboratory accuracy, simple, fast operation and ruggedness and enables the average shop to attain peak results at low cost. A fully universal instrument of 2" x 2" total range; 2¾" swing; 5" centers; and 30x magnification. Perfect for shops producing watch parts, tools, dies, templets, thread gages and taps.



Strasman Microscope

This large Leitz Strasman Microscope, one of the outstanding units in the Leitz line, is fully optical and is designed for large flat or cylindrical work within its capacity. Fine workmanship guarantees reliable results under any shop conditions and over long periods of time. Direct measuring range is 40" long by 8" wide, up to 10" swing.

Other fine tools in the optical line include Thickness Measuring Instruments and Comparators. Complete information on this universal optical line is available upon request.

GEORGE SCHERR CO., INC.
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1919 **CURTIS** 1951

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UNIVERSAL JOINTS

- **Ball type for light duty applications**
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- **Lo-Friction for special duty work**
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Write us for information on other than stock sizes up to 6" O.D. and for other than ordinary applications and requirements. As exclusive manufacturer of Universal Joints, we specialize in design collaboration. We invite your inquiry — in detail.

For over a quarter of a century Curtis has pioneered in the manufacture of Universal Joints. Famous patented Curtis "firsts" include the first ball oiler, internal lubrication grooves, the "tell-tale" lock ring and the lo-friction center block.

Curtis Universal Joints are of top quality. They have to be — consistently so — for Curtis manufactures nothing else. The fact of the matter is Curtis Standards of Quality were adopted for the Class One Specifications of the Army Air Force in 1941.

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Send for circular or ORDER DIRECT on our 10 day money back guarantee.

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Hardened Shaft—Bearing adjustable for wear. Diamond always perfectly centered. Adjustable, easily set, 180 stops.

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SPECIAL 14" WHEEL SIZE—$80.00

Special Size Angle and Radius Dressers Made to Order. Send for Quotation.

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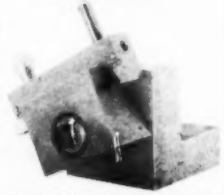

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Two answers to *one* big problem

Intelligent estimates indicate that materials handling still represents 35 per cent of the average metalworking plant's production costs. Here are two recent special reports from *American Machinist* which offer valuable answers to how these costs can be reduced . . . and quickly:

Slash Handling Costs by "Tooling" Your Shop Trucks . . . This eight-page report by Editor Miles Rowan reports on a variety of attachments available for increasing the efficiency and versatility of your shop industrial trucks, describes their use and how they will quickly pay for themselves out of savings. 15 cents a copy.

How Materials Handling Affects Plant Layout . . . Reprints of this widely acclaimed report are still available at 25 cents per copy. It's 16 pages are filled with the latest information on how production shops can best be planned for the most efficient use of modern materials handling equipment. Particular emphasis is given to the design of new buildings which can take maxmium advantage of efficient handling right from the start.

For your copies of these reports, write Reader Service Department at address below. And don't forget to read the materials handling advertising which appears regularly in *American Machinist's* pages. It keeps you up-to-date on the best and newest materials handling equipment now available from America's leading manufacturers of it.

American Machinist

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ALUMINUM TOMORROW...

Versatility and Fast Set-up Make SUNNEN® HONING a Real Time Saver for Sizing and Finishing I.D.'s

Pump engine tappet with tandem holes

Material = 1020 carburized steel
Hardness = Rockwell 60-63 "C"
Hole diameter = .625"
Length = 7/16" (each hole)
Tolerance = .00025"
Finish = 10 micro-inches
Stock removal = .0005" — .001"
Production = 1 per minute

Bronze valve body

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Drop forged gear

SPEEDS PRODUCTION OF LONG RUNS OR SHORT

Changing from one metal to another — to a different hole size — to a different surface finish — takes less than 5 minutes with Sunnen Honing. In most cases, all you do is change honing mandrels and you're ready to go again.

Sunnen Honing also simplifies and speeds production of valves, cones, gears, and other parts with irregular shapes that are difficult to chuck.

- *No jigs or fixtures*
- *No costly tool obsolescence*
- *No loading or unloading time*

Whenever bores are to be sized, finished, polished, or de-burred, investigate Sunnen Honing. For bores .185" to 5½"—open and blind holes—holes with keyways, lands, and ports. Produces any required accuracy, from roughing to micro-fitting—.0001" guaranteed. (Portable equipment range: .185" to 14.5".)

Complete installation costs less than $1,000. Send the coupon for details.

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SUNNEN HONING 578

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Tool life greatly increased by reconditioning cutting oil *with*
BARRETT OIL EXTRACTION SYSTEMS

Reports from plants using Barrett Oil Recovery and Reconditioning Systems show surprisingly high percentages in increased tool life. Then, too, users are enthusiastic as to the improved condition of the reclaimed oil as well as the high returns on the investment. Some set-ups in plants engaged on defense production have paid for themselves in a few months.

The Barrett Centrifugal Oil Extractor—which is part of a complete system—recovers 100% of the removable oil or 98½% of the contained oil from chips and turnings in 2 minutes or less. Complete Barrett oil recovery and reconditioning systems include Extraction, Sterilization and Sedimentation, together with filtration. The units involved are available in various sizes, individually or as a group, and are available with full manual control, semi-automatic control or with full automatic control requiring only loading, unloading, starting and stopping of the extractor by the operator. Complete plans including storage tanks for reclaimed oil or for use in conjunction with existing equipment are also available.

With the Barrett system, abrasive-free oil assuring longer tool life can always be depended on. With Barrett Sterilization and Sedimentation equipment, cutting oil is also safe and free from contamination.

Investigate Today by Sending for Descriptive Bulletin of Oil Recovery and Reconditioning Systems

Barrett Centrifugal Oil Extractor — the heart of Barrett Cutting Oil Recovery and Reconditioning Systems.

THE LEON J. BARRETT COMPANY, 1800 Grafton Road, **WORCESTER, MASS.**

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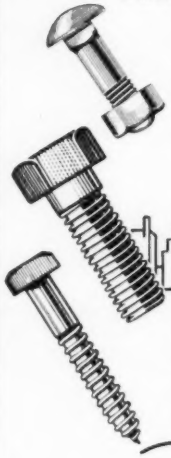
FROM THE PICTURE!



Bolts, screws, nuts, washers, cotter pins, and screw machine products made of

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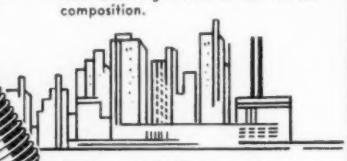
withstand rust and corroding influences longest. They are not merely "rust-proofed" — but are machined from enduring metals of non-ferrous composition.



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A full line of IN-STOCK standard sizes and threads in Brass and Bronze listed in our catalog — or special products from special alloys made-to-order quickly.

Write for our catalog—or send sample, sketch, or blueprint for immediate quotation.

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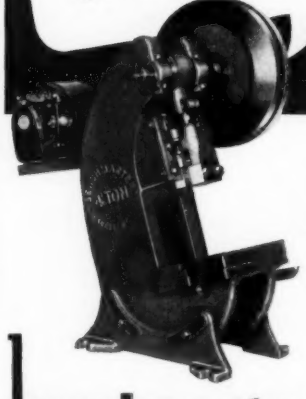
OVER 32,000 IN USE!



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8 MIRRA-LAP DIAMOND COMPOUND—A time-saving, economical diamond compound for cutting, lapping, polishing high-speed steel and carbide products.

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10 SECOMET WHEELS for finish grinding tungsten carbide tools and all carbide products also glass, ceramics, quartz.

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Please send me complete data concerning the following **precision Diamond tools and products:**

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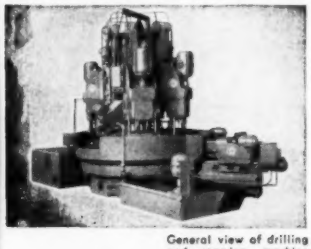
NEW! Mechanical POWER HEADS...

Help Maintain Production of 166 Pieces Per Hour — Lower Maintenance Costs

When you need high production with low unit and maintenance costs, consider the advantages of Roto-Matics. In this case the Roto-Matic is a station-type machine with indexing table. Drilling and reaming both suspension and king pin holes in front suspension support arms are performed at the rate of 83 pairs or 166 pieces per hour.



General view of drilling and reaming machine equipped with new Roto-Matic mechanical power heads.

An outstanding new Davis and Thompson development incorporated in the design of this machine are the Roto-Matic mechanical, electrical power heads operated by screw feeds. Included among the safety features are overload release clutches on the feed screws. Six heads are used, three vertical and three horizontal. Lower maintenance costs are obtained through elimination of excessive servicing.

Machines similar to this can be designed to handle dissimilar operations in the same parts or one operation on continuous production. Investigate the profitable applications of Roto-Matics.

FREE DATA will be furnished upon request. Write today. Ask for bulletin AM-1

DAVIS and THOMPSON Roto-Matic

Davis & Thompson Company

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From the *American Machinist* Library of *Tips for Top Shop Men*

WISDOM cannot be acquired wholesale. You can't swallow it in gobs; you must nibble at it. Hence the frequent statement that only the old are wise. They may not be, but they've had the best chance.

REMEMBER, it isn't your *position*, but your *disposition*, that makes you happy or unhappy. If you find fault with others continually, remember that the man who hasn't a fault hasn't a friend.

How to read with your eyes open for business!

Read the ads! Every issue of this magazine contains ads that offer valuable services and useful products by which your business may be run more profitably.

The time it takes to read all the ads is time well spent. One ad alone can pay off — by informing you of new developments and new sources of supply, by helping you do a more efficient job. For example, you may locate one machine that will cut your production costs, or step up your output. Or you may discover that the equipment you've been waiting for is now available.

This magazine displays more ideas and merchandise than a trade exposition. Make every issue your buyer's guide. Read the ads as well as the articles. That's reading with your eyes open for business.

HEADQUARTERS FOR BUSINESS INFORMATION

McGRAW-HILL publications

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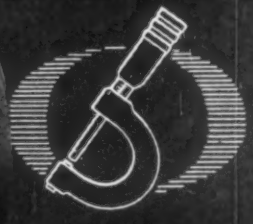
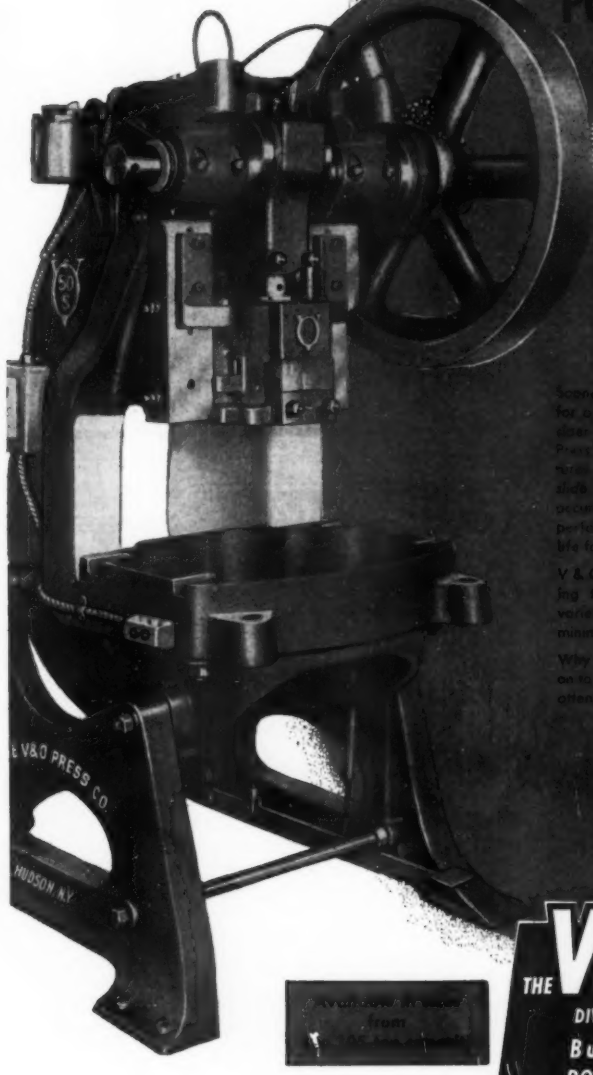
V & O
LONG SLIDE
Precision
POWER PRESSES





Sooner or later, if your production line calls for a power press, you will do well to consider a V & O Long Slide *Precision* Power Press. Its many advanced engineering features — *including the exclusive V & O long slide for accurate guiding* — assure higher accuracy for blanking, drawing, forming, perforating, and other operations, with die life for greater than ever before experienced.

V & O power presses are versatile, too, having the built-in ability to handle a wide variety of close-tolerance parts, with a minimum of time, labor and cost.

Why not pass your next press work problem on to V & O? Your inquiry will receive prompt attention.

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Builders of Precision
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Since 1889 HUDSON, N.Y.

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LOW COST High Frequency HEATING UNIT

AT A PRICE SO LOW THAT NO MACHINE SHOP, TOOL ROOM OR LABORATORY CAN AFFORD TO BE WITHOUT IT!

Unit illustrated brazing carbide tips to cutting tools. Shanks up to 1½" square can be satisfactorily brazed.

- **SMALL and COMPACT** Conveniently operated on bench or table—no mounting necessary.
- **ECONOMICAL OPERATION** No special power installation required. Operates on 110 volts, 60 or 50 cycle line at unity power factor.
- **FULLY GUARANTEED** Guaranteed for continuous duty cycle and stated performance.
- **LOW COST** Complete unit with line connection and load coil $780.00 f.o.b. factory

DOES ALL THESE JOBS *Faster, Better and Cheaper*

BRAZING, SOLDERING HARDENING, ANNEALING DRAWING AND MELTING

WILL HEAT TO 1500° F.

⅛" steel rod 1" length in approx.	1 second
¼" " " " " "	3 seconds
½" " " " " "	15 seconds
1" " " " " "	60 seconds

Will melt 4 ounces of brass or steel in 4 minutes.
Equally well suited for heating of non-ferrous metals.

HARDEN SOLDER **Lepel** HIGH FREQUENCY HEATING UNITS BRAZE MELT

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PROVIDES COMPLETE CONTROL OF VOLUME — DIRECTION — PRESSURE AT THE PUMP without valves

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1. LUBRIPLATE reduces friction and wear
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Write today for case histories of savings made through the use of LUBRIPLATE in your industry.

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the "holes in our heads" are full

. . . OF COST-CUTTING IDEAS

Yes, the "holes" in our engineers' heads are full of ideas to give you newer, faster, lower cost methods of boring . . . methods that save you time and money. If your job needs a special bar or special cutter, we'll design and make it. Chances are a standard Madison cutter in the right Madison bar will give you greater production economy. The Madison line, built over a period of thirty-five years, is broad enough to fit nearly any boring requirement. Let Madison's experienced boring specialists . . . the "men with the holes in their heads" . . . help you cut your boring costs. Submit your problems for recommendations by our problem solving tool design department. Of course there's no obligation.

Write for the information filled Madison Catalog. It is yours for the asking.

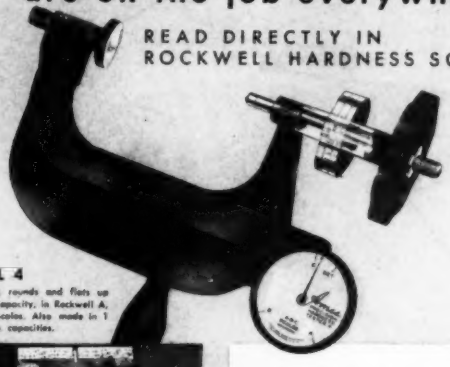
Tools for rough boring; finish boring; combination rough and finish boring, multiple cutting, bottoming; and other special tools.

MADISON MANUFACTURING CO.

DEPT. AM **MUSKEGON, MICHIGAN**

Ames HARDNESS TESTERS are on the job everywhere!

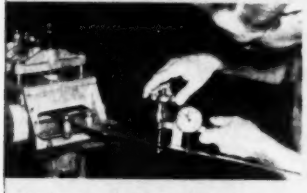
READ DIRECTLY IN ROCKWELL HARDNESS SCALES



MODEL 4

For testing rounds and flats up to 4 inch capacity, in Rockwell A, B and C scales. Also made in 1 and 2 inch capacities.

Testing hardness of babbitt metal with Model S reading in Rockwell N and T scales.



Testing strip steel before fabricating — an important operation that insures against defective materials.

You'll find Ames Portable Hardness Testers being used in warehouses, machine shops, schools, on the production line, and in the field — where accurate, on-the-spot, time-saving hardness tests have to be made. No specimens to be cut off — no waiting for laboratory tests — because Ames Testers are light in weight and are carried to the work.

Ames Hardness Testers are used to determine machinability and workability of rods, strip and sheets before fabricating to prevent undue machine wear or tool breakage resulting from excessive hardness. They also are used on saws, knives, gears and large parts. A practical trouble shooter for any plant. No skill required to get accurate results. Testers come in convenient carrying cases.

More than 1500 in use. Send for descriptive bulletin.

AMES PRECISION MACHINE WORKS
WALTHAM 54, MASS.

From the *American Machinist* Library of *Tips for Top Shop Men*

WHEN you report on anything, keep it brief. Supply details only when they're asked for. If the recipient wants more information, he'll ask. If you give him too much, he'll probably never read it in the first place.

KIDS enjoy surprises; grown-ups rarely do. Hence, keep those above you informed of what you're doing. Don't let your boss be in the embarrassing position of not knowing what's going on in his department — unless you're out to cut his throat. If you are, watch yours.

Here's Why it Pays You to Read the Advertising

The advertising is a rich source of valuable information. In this magazine it offers you ideas and products that may well apply advantageously to your business.

Every issue is a catalog of goods, materials, and services — quickly available to you — just for the reading.

Leaders in business and industry turn to the advertising because they've discovered it helps them run their businesses more profitably.

When you read all the ads in this magazine, the chances are good that you'll get a lead that will materially help you do a better job. For example, you may find a specific piece of equipment that will be a profitable time-saver. Or a tool that will increase worker efficiency. That's why it pays to read the advertising. It's good business.

HEADQUARTERS FOR BUSINESS INFORMATION

McGRAW-HILL publications

F-25

Any Speed YOU NEED

WITH

GEARMOTOR

. . . because it is available in single, double or triple reductions, offering a range of speeds: 780 through 7.5 r.p.m. Motor rating from 1 h.p. through 60 h.p.—A-c or D-c. The motors and gear units are each self-contained and readily separated . . . gears in multi-reduction units may be inspected, without uncoupling from driven machine.

These small, compact, self-contained units simplify the direct application of electric drive to individual machines.

GearMotoR conforms to the recommended standards of the American Gear Manufacturers Association and the National Electrical Manufacturers Association.

Send for 42-page illustrated catalog, containing full information and data necessary for ordering, and please use your Business Letterhead when requesting same.

Philadelphia Gear Works, INC.

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Industrial Gears and Speed Reducers
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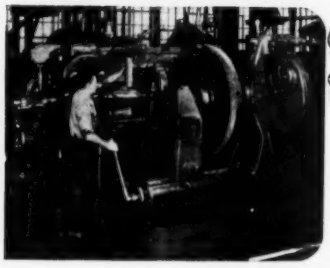

..to help make BETTER GEARS!

This 18 ton Herringbone Continuous-tooth Generator, handling gears and pinions up to 60" PD, 2 DP, is a recent addition to Stahl's modern equipment. Stahl skill and experience, plus the finest precision machines, assure accurate, durable gears in all sizes. For the economical answer to any gear problem get a Stahl estimate first.

SPURS TO 72" PD, 1 DP
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SPIRAL, HELICAL and WORM GEARS TO 48" PD, 2 DP
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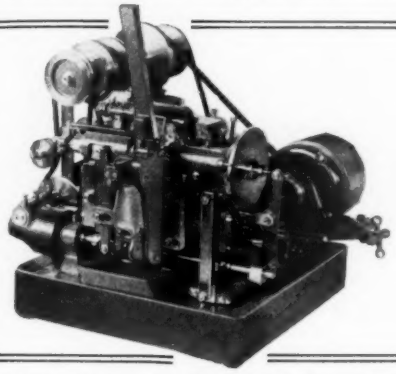

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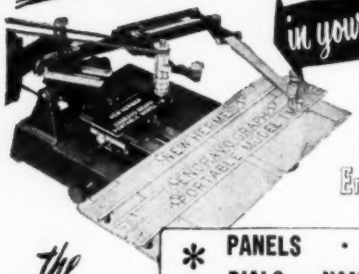

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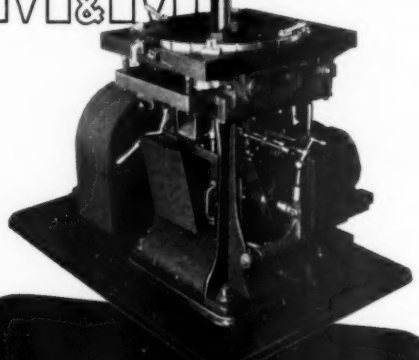

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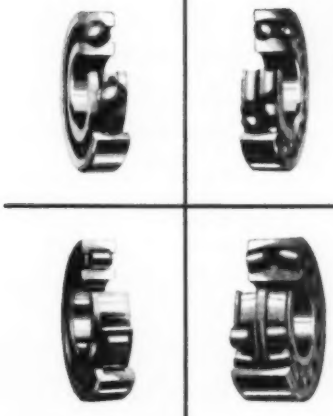

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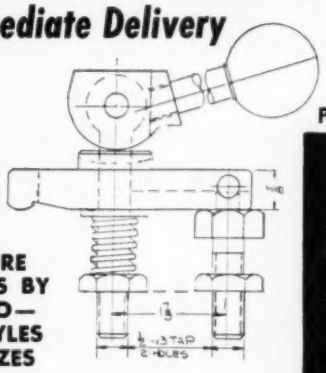

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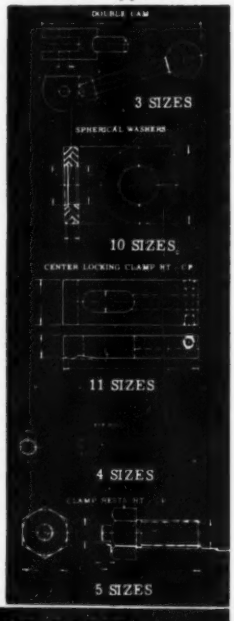
Below shows Parts of Type No. 2



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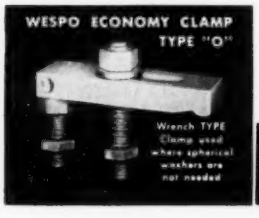

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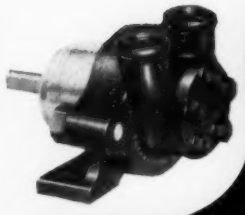

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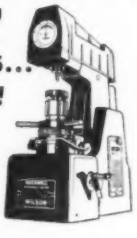

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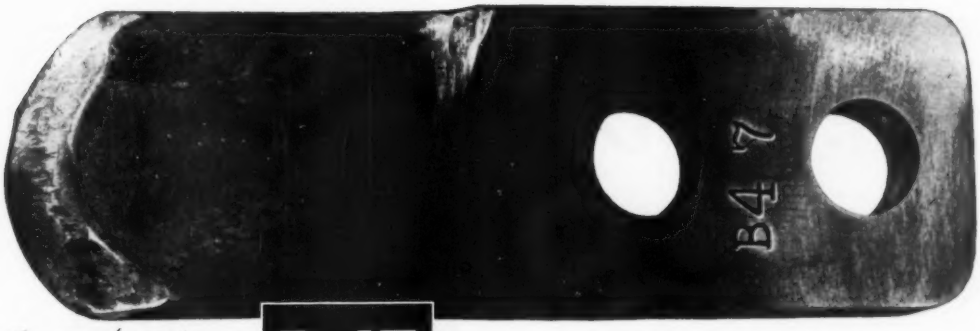

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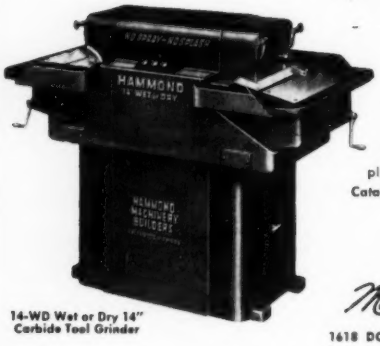

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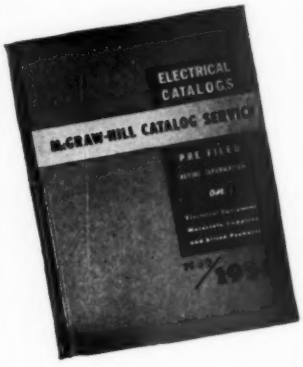

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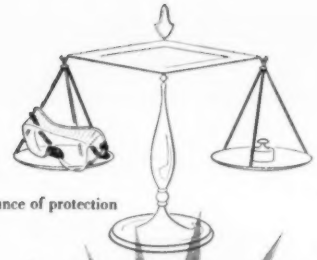

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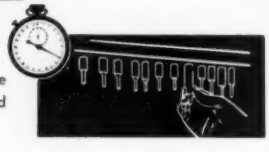

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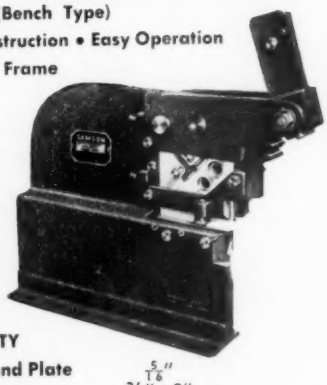
No. 5RP7

$198.80
f.o.b. New York
(subject to change)

IMMEDIATE SHIPMENT



CAPACITY

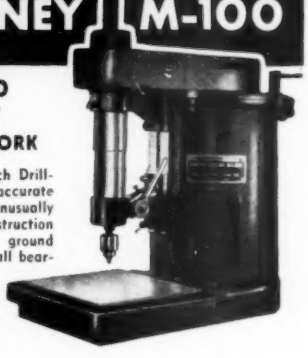
Sheets and Plate	$\frac{5}{16}$"
Flats	$\frac{3}{8}$" x 3"
Rounds	$\frac{5}{8}$"
Squares	$\frac{1}{2}$"
Angles and Tees	2" x 2" x $\frac{3}{16}$"

Catalogue of Metal Working Equipment furnished on request.

JULIUS BLUM & CO., Inc.
532 West 22nd St., New York 11 • WAtkins 9-7042

SIGOURNEY M-100

MAINTAINED ACCURACY IN PRECISION WORK



The Sigourney M-100 Bench Drilling Machine is extremely accurate on precision jobs. It is unusually sturdy and rigid in construction . . . has hardened and ground spindles . . . and sealed ball bearings throughout. All moving parts are entirely closed for maximum operator safety. M-100 is built for long and steady service.

This sturdily constructed bench drilling machine is available in 1, 2, 3, and 4 spindle models . . . speeds from 4,000 to 10,000 r.p.m.

Send for illustrated bulletin

THE SIGOURNEY TOOL CO.
Hartford 6, Conn.

Sole Sales Agents
PRATT & WHITNEY
Division Niles-Bement-Pond Co. West Hartford, Connecticut

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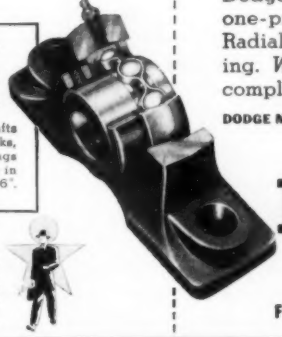
The Seal Won't Blow!

DODGE TYPE "SC" BALL BEARING PILLOW BLOCK

Precision built bearing for small shafts and moderate loads. Pillow blocks, flange bearings and hanger bearings available from distributors' stocks in shaft sizes ranging from 3/4" to 2-7/16".



CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained, he can give you valuable assistance on new, cost saving methods. Look for his name under "Power Transmission Equipment" in your classified telephone book.

METALLIC-BACKED neoprene seals are used in this famous bearing — and they are engineered to *stay put.* They can't blow.

Your lubricant stays in; dust and dirt stay out; the result is years and years of trouble-free performance.

The "SC" Bearing is a new member of the Dodge 30,000 hour line. Modern styling. Rugged one-piece cast iron housing. Long inner race. Radial and thrust load capacity. Fully self aligning. *WRITE* for special "SC" bulletin, giving complete specifications.

DODGE MANUFACTURING CORPORATION, 100 Union St., Mishawaka, Ind.

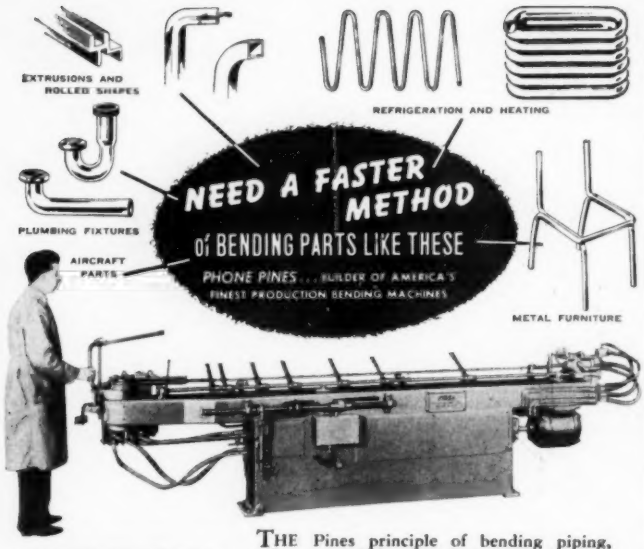
DODGE

of Mishawaka, Ind.

FIRST IN POWER TRANSMISSION MACHINERY

NAME PLATES

FOR YOUR NAME PLATE REQUIREMENTS, WRITE OUR SUBSIDIARY,
CHICAGO THRIFT ETCHING CORPORATION, 1555 N. SHEFFIELD AVE., CHICAGO, ILLINOIS


EXTRUSIONS AND ROLLED SHAPES
REFRIGERATION AND HEATING
NEED A FASTER METHOD
of BENDING PARTS LIKE THESE
PHONE PINES . . . BUILDER OF AMERICA'S FINEST PRODUCTION BENDING MACHINES
PLUMBING FIXTURES
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COST CUTTING FEATURES OF PINES BENDERS

- Produces Accurate Uniform Bends without marking or distorting.
- Push-Button Control — simple, easy for one man to operate.
- Highly Versatile — handles wide variety of work — serpentine, coil, compound or multiple bends.
- Fast Set-Ups — tool changes in 10 minutes.
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THE Pines principle of bending piping, tubing, extruded or rolled sections and mouldings, employes tested and proven methods that assure best results and peak production. Roll, compression, draw, and stretch bending methods are skillfully adapted to best suit your material and product needs. Hydraulic power, push-button control and automatic operation is combined to assure high efficiency and lower production costs. Ask Pines to analyze your bending problems now. Phone Aurora 2-7608.

WRITE FOR FREE LITERATURE
Find out how the Pines Benders are designed to save time and cut costs. Literature describes and pictures various models, attachments, and methods on actual jobs.

672 WALNUT AURORA, ILLINOIS

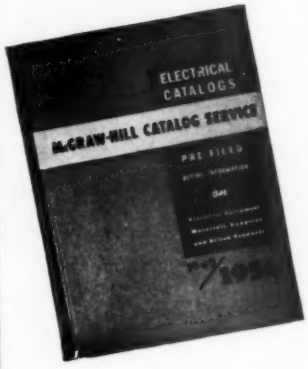
From the *American Machinist* Library of *Tips for Top Shop Men*

IF your plant is still departmentalized, study the advantages of straight-line rearrangement. Handling is usually too expensive nowadays to justify the luxury of having each type of machine tool segregated. The same goes for heat treating, cleaning and assembly.

BE sure you are modernizing a *job*, not just a machine. A new piece of equipment never gets a fair chance if units ahead and after it are still ancient klonkers and if feeding and workhandling devices are inadequate.

When the need for an electrical product arises in your plant, get the habit of referring to the

McGRAW-HILL Pre-Filed ELECTRICAL CATALOGS



Several hundred pages of manufacturers' buying information will help you compare and select. The directory lists all known manufacturers, classified alphabetically and by product.

If the Pre-Filed ELECTRICAL CATALOGS are not available for buying reference at your plant, write to:

McGRAW-HILL CATALOG SERVICE
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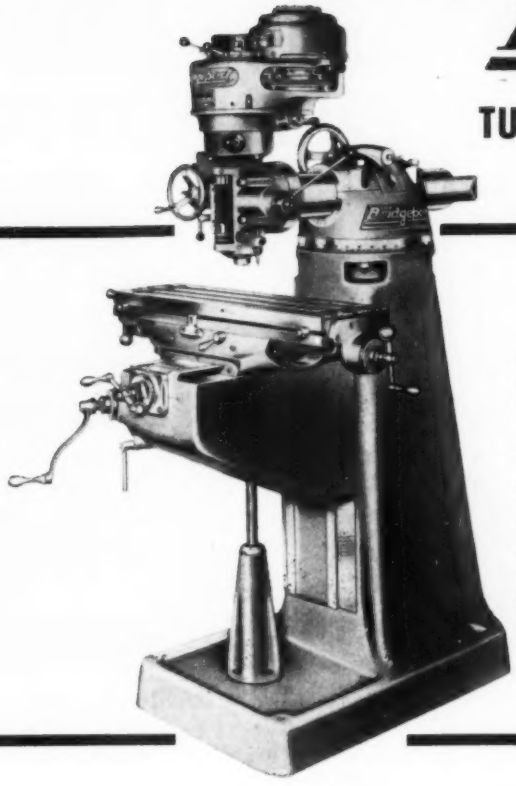
Bridgeport

TURRET MILLING MACHINES

will continue to win
ever-widening acceptance

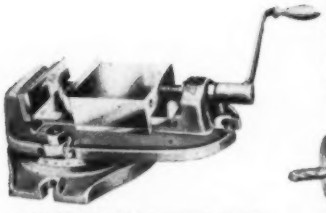


More than 12,000 are in service today

Since announcing the new Bridgeport 1 HP Head less than two years ago, these higher capacity machines with their recently developed attachments have been moving into metal working shops in a constant stream. Tool rooms, die shops and production lines are taking advantage of the greater versatility, capacity and convenience available to speed up the handling of larger, more difficult work.

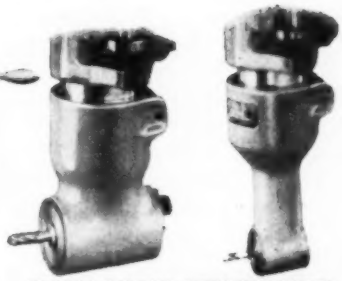
Bridgeport Attachments are adaptable to machines already in service as well as to the higher capacity, 1 HP head, thereby making it possible to increase the productivity of "Bridgeports" wherever it is desired to do so.

It will be to your advantage to ask for more detailed information.



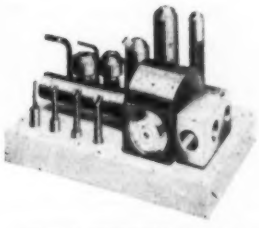
MILLING MACHINE VISE

This improved vise provides greater gripping power. It is streamlined for attractive appearance and furnished with a large diameter screw for rigid holding. A coolant trough is provided. Made in two sizes; 5" x 3½" and 6" x 5" jaw openings.



RIGHT ANGLE ATTACHMENTS

Available in two types: Heavy duty (left) and light duty (right). The heavy duty attachment is made in two sizes and will mill and drill at right angles. It fits both the Master and the 1 HP Bridgeport heads. The light duty type is designed for milling and drilling of narrow, deep molds and cavities.



No. 2 BORING HEAD

Boring tools and holder make this attachment capable of boring holes up to 6" diameter. It is available for use on the Bridgeport 1 HP Milling, Drilling and Boring Attachment.

Bridgeport MACHINES, INC.

Bridgeport, Connecticut

Manufacturers of High Speed Milling Attachments and Turret Milling Machines

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A practical manual demonstrating the best methods for designing, drafting, and using drilling jigs, and tapping and milling fixtures, illustrating the fundamental principles by which all tools must be designed for successful operation. With a wealth of detailed operational functions of tools, mathematical formulas, tool engineering tables, etc., it supplies all the essentials of designing and drafting tools and gives many new ideas for doing machine work and for designing tools. *By C. W. Hinman, Second edition, 416 pages, 446 illustrations, $4.50.*

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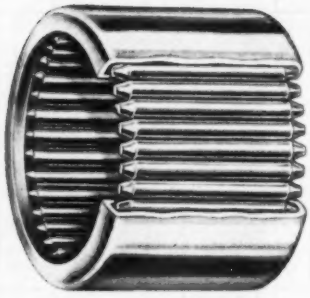
WORCESTER, MASS. • DETROIT, MICH.
Original Producers of Grinding Lubricant

TORRINGTON NEEDLE BEARINGS

stand up in rugged service



A full complement of small diameter rollers spread radial loads evenly over a large area, roll easily under the shock. This feature gives Torrington Needle Bearings a higher capacity in proportion to their size than any other anti-friction bearing, and assures long, satisfactory service life in the toughest applications.

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What's good grooming for a golf shaft?

...a brush!

Prior to plating, golf shafts must be perfectly clean, free of heat-treat discoloration and surface imperfections. In cleaning and finishing, the problem was to get into the corners of the tapered True Temper "step-down" and to do the job in one pass at high speed.

The problem was solved with a five-station, in-line automatic machine equipped with Osborn Fascut® Brushes. This automatic brushing gives the shafts a smooth, uniform finish over the entire surface . . . and it has increased output 20% over the former method.

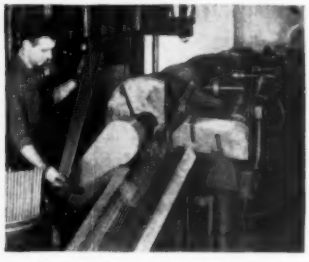
Perhaps new Osborn brushes and brushing techniques can improve *your* products and step up your productivity. An **O**sborn **B**rushing **A**nalyst will gladly survey your operations. Write today for an **OBA!** *The Osborn Manufacturing Company, Dept. 380, 5401 Hamilton Ave., Cleveland 14, Ohio.*

OSBORN

LOOK FOR THE NAME OSBORN . . . RECOGNIZED EVERYWHERE FOR QUALITY WORKMANSHIP AND MATERIALS

Osborn Brushes step up finishing output 20%

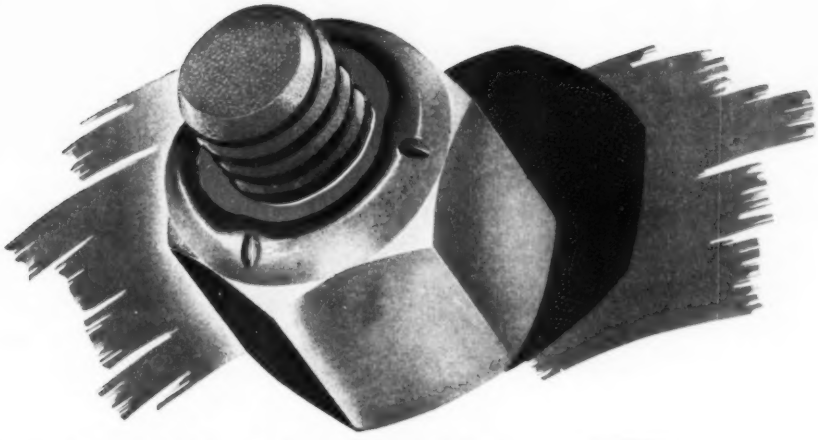
The problem here was to remove heat-treat discoloration and surface imperfections from golf shafts prior to plating. Due to the tapered True Temper "step-down" design of the shaft, it was difficult to get into the "step-down" corners with the former method. Two or three passes were required for thorough cleaning.



Now, with the five-station machine shown above, Osborn Fascut® Brushes, with compound, finish the shafts in one pass, netting a 20% increase in output. Uniform quality of finish over the entire surface is duplicated accurately from piece to piece due to the ability of the Fascut Brushes to blend with the exact contour of the golf shaft.

Brushes run at 900 rpm. Output of the machine is 1500 shafts per 8 hours or about 10 feet of shaft per minute.

If your production problem involves finishing or cleaning of parts, an **O**sborn **B**rushing **A**nalysis most likely will demonstrate how this work can be done more efficiently . . . at less cost with new, improved power brushing techniques. Call or write Osborn for this service. There is no obligation.



ANCHORED *Forever*

•••OR RELEASED IN AN INSTANT!

The efficient Greer *Self-Locking* Nut solves many a tough engineering problem. So simple in principle . . . so easy to apply . . . *YET* so *powerful* in it's unshakable locking grip! It's 100% secure, clamped and *set* against every conceivable vibration! *Best of all*, an ordinary wrench unclamps it again in an instant!

VIBRATION TESTED FOR THOUSANDS OF HOURS

Probably the toughest test of all for GREER *Self-Locking* Stop Nuts is on pneumatic drills. Here they pass thousands of grueling hours of violent vibration with flying colors . . . NOT ONE has shaken loose to our knowledge.

GREER LOCK NUT MEETS THE ANA REQUIREMENTS

Where small but strong fastenings must be applied (and later removed) . . . are subjected to vibration and must stay ABSOLUTELY TIGHT . . . GREER *Self-Locking* Nuts have proved to be ideally suited.

GREER

Self Locking Nuts

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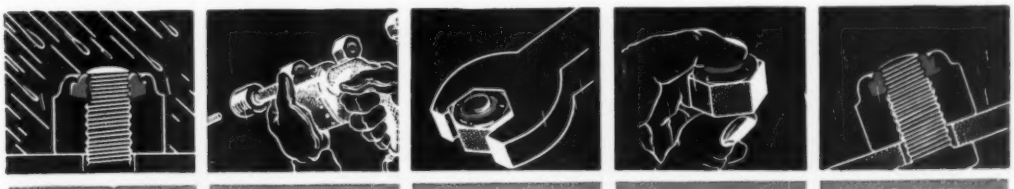
GREER STOP NUTS FOR APPLICATION IN ALL INDUSTRIES



SEALED	FASTER ON	FASTER OFF	RE-USABLE	NO PLAY
Protects working threads.	Tighten, and it's on to stay!	Ordinary wrench does it!	Use them again and again!	Keeps threads tight.

NEWS FROM UTICA

Pioneering and improvements it will pay you to know about

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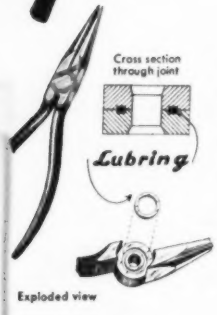


The finest pliers—the LUBRING line—have a ring of oil-impregnated porous iron floating in the joint. The ring slowly feeds lubrication and assures smooth action, long life. Standard equipment for several top utilities.

2 NEW SAFETY AND COMFORT IN SPECIAL HANDLES

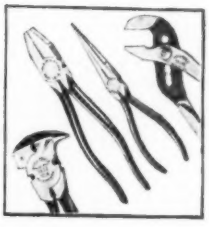
Heavy rubber vulcanized handles for insulation—slip-on plastic handles that are non-burning, non-explosive—dipped plastic handles for comfort—handle springs for ease in use. For almost all UTICA tools.

3 WRENCHES THAT LAST TEN TIMES AS LONG . .

Adjustable wrenches with electronically hardened jaw *surfaces*. Resist burring and nicking. Last up to 10 times as long. Their thin pattern was designed to reach the hard-to-get-at places—with *plenty* of strength!

4 80 TOOLS . . 151 SIZES. THE RIGHT TOOL FOR YOUR NEED

You get *exactly* what you want from UTICA! A full line of pliers and adjustable wrenches. Every tool checked in every step of manufacture, and *tested*. For long-run economy in your production line.



Utica Drop Forge & Tool Corporation, Utica 4, N. Y.

BETTER PLIERS FOR EVERY PURPOSE

It pays to use U TI CA quality tools

AND THE WORLD'S BEST TOOLS ARE MADE IN U. S. A.

BARNES

HACK SAW BLADES

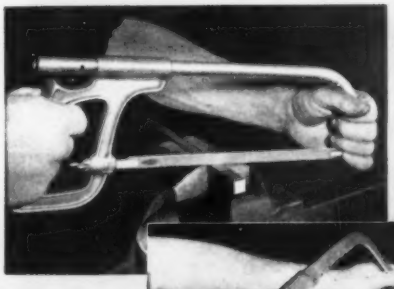
PERFECT

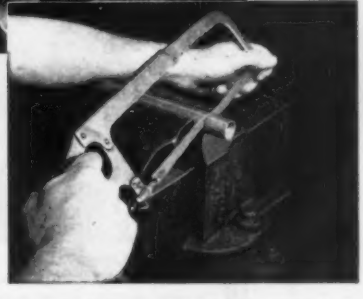
IN ANY FRAME!

BARNES HAND BLADES

MOLYBDENUM • RED ARROW

The Red Arrow Molybdenum Hand Blade is manufactured for general and tool room use. It is a long wearing blade of exceptional cutting ability. Being both tough and hard, it retains sharpness and will outwear standard tungsten blades 5 to 1.





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In any frame—Barnes Blades are uniform, tough, efficient and therefore the most economical you can use.

FAMOUS FOR QUALITY

BARNES

Established 1919

W.O. Barnes CO., INC.

The above photo shows Barnes standard flexible hand blade in use.

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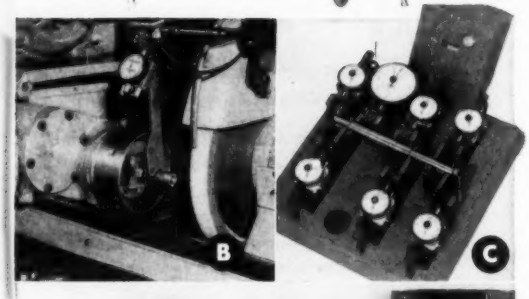


Sorts 1000 parts per hour into 18 categories differing by .0001". Former method sorted only 175 parts per hour.

As a result of wide experience with all modern gaging systems — mechanical, air, electrical, and electronic — Federal has established a top reputation for Automatic Dimensional Gages. Federal's versatility and know-how are ready to serve you in designing and building every type of gage from "Continuous Measuring" to "Automatic Sorting."

A CONTINUOUS MEASURING GAGES

Glass rods, sheets, and tubes; strip steel and rods; rubber and plastic covered wire; paper; sheet rubber; and many other continuously produced materials are gaged continuously and automatically to *save* material and *protect* quality.

B MACHINE SIZE-CONTROL GAGES

Electrical, Electronic and Air Gages are designed and built for automatic *size-control* of machine operations. They prevent waste, save time, protect quality. They increase output per manhour by enabling operator to handle more machines.

C MULTIPLE DIMENSION GAGES

With the use of the Federal Electricator, many dimensions can be gaged simultaneously by watching a *single light*. When this light indicates an incorrect dimension, that dimension is quickly identified on the Indicator which also tells the operator *how much* the dimension varies from the correct size.

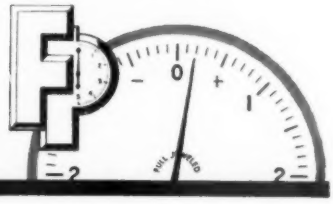
D SORTING GAGES

Federal semi- and fully-automatic Sorting Gages are size-sorting all kinds of products: steel balls 1/64" diameter and larger, paper-thin copper washers, piston pins, spark plug bodies, compressor pistons and pins, fountain pen barrels, depths of dies. Built from standardized electronic units, they are establishing new records for speedy, economical size control.

We welcome your inquiries. Please send sample parts and blueprints, if possible, for engineering study. No obligation. Federal Products Corporation, 1121 Eddy St., Providence 1, R. I.

FEDERAL

Largest manufacturer devoted exclusively to designing and manufacturing *all types* of DIMENSIONAL INDICATING GAGES



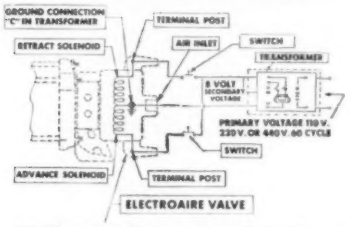
The only AIR CYLINDER with all controls

Built-in!

Independent Speed Controls (Retract and Advanced Strokes)
Sealed Solenoid Control Unit (retract stroke)
Four-Way Directional Valve
Wiring Terminals
Single Air Connection
Sealed Solenoid Control Unit (advance stroke)
The Bellows Co

Model Shown is Equipped with the Electroaire Valve for full Electrical Control. Also Available with Manual Control Valve

WIRING DIAGRAM



All Electroaire Valve equipped Air Motors are shipped complete with the Bellows special transformer to step down line voltage to eight volts.

The Bellows Air Motor combines in one compact, complete power unit: double-acting air cylinder, four-way electrically-controlled directional valve, and speed regulating valves. There are no extra valves to buy. The built-in Electroaire Valve* is fast, safe, long lived — guaranteed against solenoid burnout.

Integral Construction Means Instant Action

The piston responds to a touch on the start switch (no matter how remotely located) as quickly as an electric motor.

Integral Construction Means Accurate Speed Control

Piston rod speed in either or both directions can be precisely regulated, *with no power loss.*

Integral Construction Means Compactness

Streamlined, space-saving, weight-saving design fits well into crowded quarters or on moving machine elements.

Integral Construction Means Simplified Installation

Installation is quicker . . . easier. No rigid piping. No multiple air connections. The *one* air connection required can be made with flexible air hose.

When you design for pneumatic operation, you will save time, money, and space with the Bellows Air Motor—the only air cylinder with all controls built in.

*TM Registered. Patent Applied For.

STANDARD SIZES

Bellows Air Motors are made in five bore sizes: 1¼", 1¾", 2½", 3⅜", 4½", and in any stroke length.

•

All Bellows Air Motors are available with either the built-in electrically controlled Electroaire Valve or manually controlled valve, and in a wide range of mounting styles.

WRITE FOR NEW BULLETIN CL-30.
Specifications, wiring diagrams, design and construction detail. Address: The Bellows Co., Dept. AM 122, Akron 9, O.

The Bellows Co.

AKRON 9, OHIO

Always

The RIGHT Speed for the Job!

BRADFORD

Infinitely Variable Speed

SNAGGING GRINDERS

SAVE ON GRINDING WHEEL WEAR

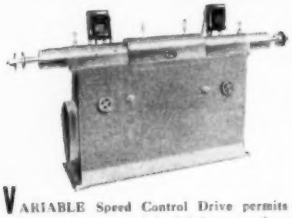
by use of constant maintained surface speed control. Save labor—no belts to move, no gears to change. Speed is adjustable while grinder is running. Maintained speed automatically adjusted to wheel wear. Designed to give 9500 SFPM for Hi-Speed Wheels or 5500 SFPM for Vitrified Wheels. Four models for wheel sizes 20" to 30" diam. by 2" to 4" face—7½ to 30 HP.

Savings in grinding wheel costs will pay for a Bradford in a short time. You'll get better quality work and higher production.

BRADFORD

Infinitely Variable Speed

BUFFER AND POLISHER



VARIABLE Speed Control Drive permits selection of any speed in infinite steps from 1500 RPM to 3000 RPM. Speeds may be changed instantly while buffer is running; to change from job to job; to maintain correct surface speed for material being polished or buffed; for size of wheel being used. Two Models: Single Motor, Double Spindle; or Double Motor, Two Independent Spindles. 5 and 7½ HP.

You'll get more and better production plus savings in wheel costs and labor with Bradford Infinitely Variable Speed Snagging Grinders and Buffers. *Complete details and specifications sent on request.*

THE BRADFORD MACHINE TOOL CO.
664 Evans St. Cincinnati, Ohio
Precision Since 1840

DO YOU REMEMBER...

When New York City was digging its first subway? When America's highest building was a mere 29 stories? When the Klondike gold rush was at its height?

It was 1900 . . . William McKinley was in the White House and the national budget was about two per cent of what it is today. The "sit-down" strike had just been demonstrated for the first time, and the assembly line was still an infant.

"When Metalworking Turned the Corner—and the Century," an interesting 16-page Special Editorial Report, recalls these and other lively events of the first year of the century in which Metalworking has grown to be America's biggest industry . . . with well over 4,000,000 employees in its major plants. Extracts from *American Machinist* issues of 1900 provided much information for this Special Report . . . give you an exciting and interesting picture of American Metalworking in 1900.

Reprints of this Special Editorial Report are still available at 25¢ each. Write Reader Service Department:

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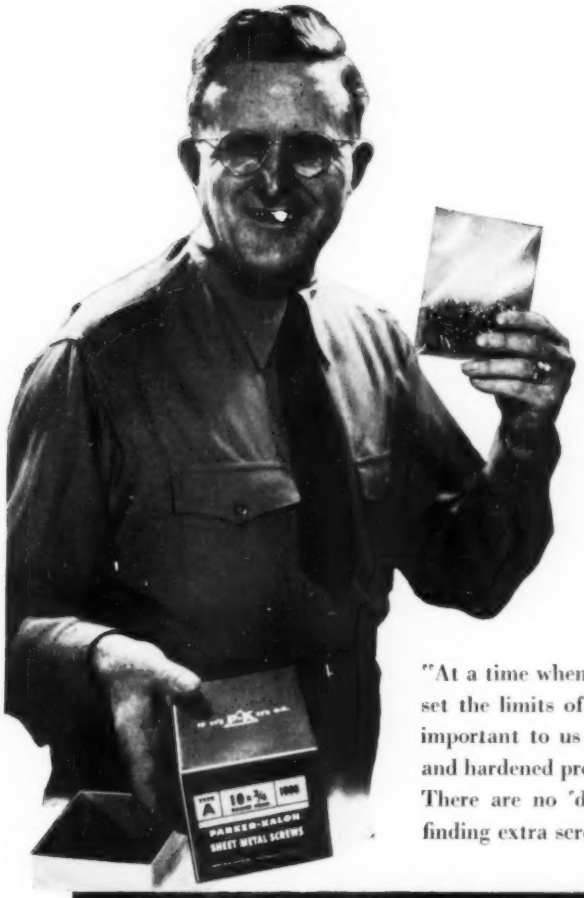

"Like finding extra screws in every box!"

"At a time when a shortage of screws can very well set the limits of production, P-K* quality is more important to us than ever. Every screw is formed and hardened properly to drive right and hold right. There are no 'duds', and, believe me, that's like finding extra screws in every box!"

P-K will help in other ways to stretch your screw supply

P-K Assembly Engineers will help you in every way possible to adjust your assemblies to limited supplies. You may be able to use standard screws in place of hard-to-get "specials". By simplifying assemblies, you can sometimes use fewer screws without sacrifice of strength. Reducing multiple head styles, and using fewer diameters, with longer or shorter screws as needed, will also often help you to get improved deliveries.

Parker-Kalon, originators and leading producers of Self-tapping Screws, stand ready to apply their long experience to your most difficult problems of planning and procurement. Parker-Kalon Corporation, 200 Varick Street, New York 14, N. Y.

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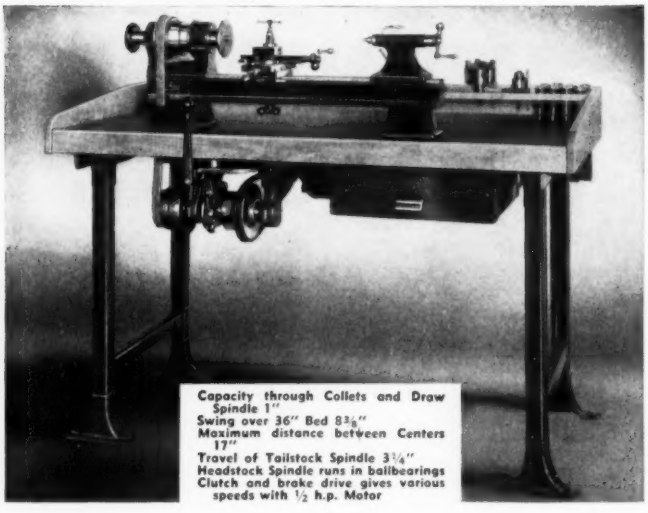
The Original
PARKER-KALON* SELF-TAPPING SCREWS
A TYPE AND SIZE FOR EVERY METAL AND PLASTIC ASSEMBLY

AMES PRECISION BENCH LATHE with UNIT DRIVE and TABLE


Capacity through Collets and Draw Spindle 1"
Swing over 36" Bed 8 3/16"
Maximum distance between Centers 17"
Travel of Tailstock Spindle 3 1/4"
Headstock Spindle runs in ballbearings
Clutch and brake drive gives various speeds with 1/2 h.p. Motor

The Ames Precision Bench Lathe, complete with Unit Drive and Table is compact, efficient and capable of doing the finest precision work.
For more than 50 years, Ames Lathes have been used in many of the leading factories where accuracy and dependable service are required.
A complete set of attachments is available for turning, drilling, milling, grinding, treading etc., and lever attachments that save time when producing quantities of duplicate parts.

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Precision Die Made—Lowest Possible Cost.
DAYTON ROGERS MFG. CO., Minneapolis 7, Minnesota

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Proper application of clad materials can cut costs and save scarce metal. Output of clad materials has more than doubled since 1946 . . . has climbed to more than 23,000 tons per year and may reach 1,000,000 tons by 1960. Clad materials offer advantages that may well have profit-wise applications in your business.

Clad materials are not difficult to work, require only care and routine experience. "How to Work Clad Materials," an *American Machinist* Special Editorial Report, contains all the latest facts on how to work clad materials most efficiently and profitably. This 16-page report, complete with informative drawings, diagrams, and photographs, is still available for only 25¢ a copy. Write to Reader Service Department:

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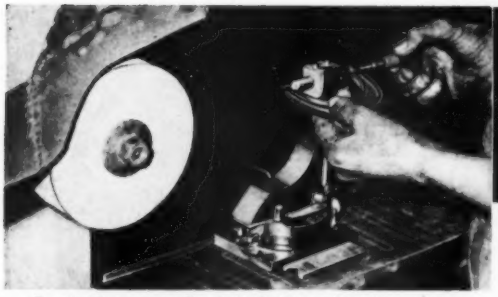
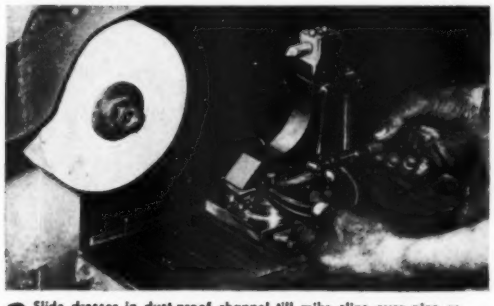
HOW A J&S "*Fluidmotion*"* WHEEL DRESSER *cut production costs*

FOR THE ADAMAS CARBIDE CORPORATION

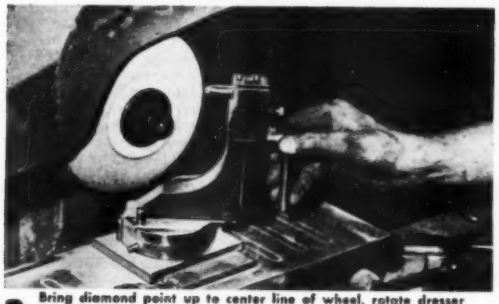
Paul C. Boniti, Shaping and Forming Supervisor of the Adamas Carbide Corporation, Harrison, N. J., reports that his standard Model "E" J & S "Fluidmotion" Wheel Dresser has



1 To set-up for convex radius, first mike distance from diamond point to micrometer plate, then add radius desired. (For concave radius, subtract).



2 Slide dresser in dust-proof channel till mike slips over pins as shown and lock with socket wrench. Dresser is now ready for action.



3 Bring diamond point up to center line of wheel, rotate dresser on swivel base in one continuous motion. A clean, accurate radius results! No chatter marks.

OTHER "Machine Shop TIME SAVERS" by J & S

J & S "All-Purpose" Jaw Clamps, KOALA Circular Cutting Tool, "Down-Hold" Vise Jaws, and "Attachable" Parallels. Write for "Time Savers" Booklet.

- **Cut set-up time**
- **Cut dressing time**
  (save on diamond and wheels)
- **Cut maintenance cost**
  In 4½ years grinding presintered carbide has cost $17.50 to maintain — less than $4.00 per year.

HOW "Fluidmotion" saves time is demonstrated at left. Photos taken at Adams Carbide show how a concave or convex radius—accurate to .0001" can be obtained in three **simple** steps.

Dressing two angles **tangent** to a radius **is simple.** Only one more step is necessary. After radius is set (steps 1 and 2) the dresser is swung on its graduated base to first one angle, then the other, and both are locked in with a turn of the knurled knob. Actual dressing is again accomplished in **one continuous motion—it is not necessary to move the dresser on dove tails to form the angles.**

It is **important** in our work to have a rigid dresser that can dress a wheel **true consistently,** leave no chatter marks, **and still not have the abrasive content in the presintered material affect the accuracy of the dresser.** This I can personally vouch for. J & S "Fluidmotion" in **4½ years** has passed this test. I have complete confidence in "Fluidmotion"—no trial and error in order to obtain accurate forms. Our company has enjoyed the lower production cost made possible by "Fluidmotion's" repeated accuracy and ruggedness. It's a **cinch** to do our grinding jobs.

Adamas Carbide, well known for its **high quality, low cost carbide blanks,** attributes a fair share of its success in attaining more efficient production to its J & S "Fluidmotion" Wheel Dresser.

You, too, can also cut production costs by employing the J & S "Fluidmotion" Dresser in your tool room.

Application to any **surface or cylindrical grinder** is quick, simple. Set-up and dressing time is yet the lowest to be found.

Wheel Dressers made to dress wheels accurately up to 36" in diameter, and designed to meet your grinding requirements.

*Reg. U. S. Pat. Off.

For details, write to:

J&S TOOL CO., INC.
479 Main Street, East Orange, N. J.
Representatives in Principal Cities

25% FASTER TUMBLING

New equipment and materials are combined to increase direct-labor savings over previous tumbling methods

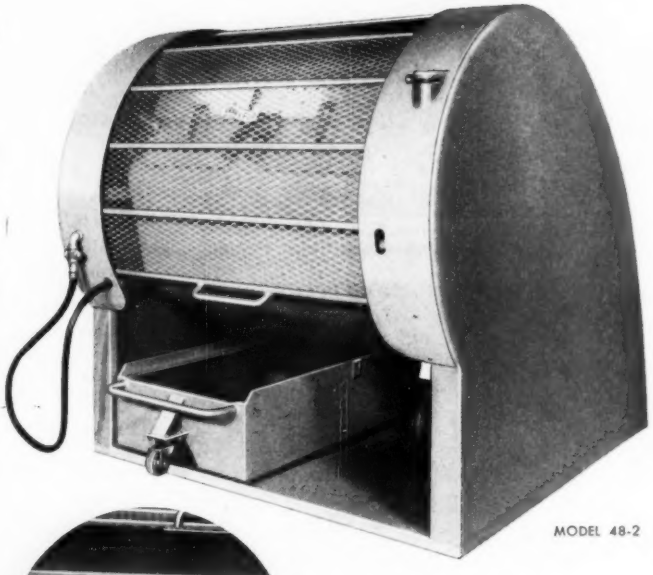
NEW MACHINE HANDLES

30% More Volume!

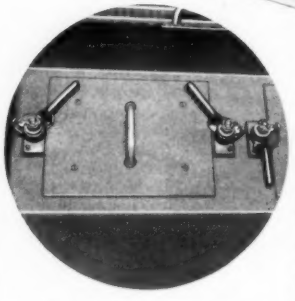
30% Larger Work Load!

than comparable machines occupying the same square feet of floor space.

GRAV-I-FLO offers the first big advancement in modern tumbling—with improved equipment and materials for every tumbling need. New Grav-i-Flo process, with Super-Brite finishing chips and specially designed machinery giving a smoother surface and higher lustre, now cuts 25% to 40% faster on non-ferrous metals—eliminates subsequent operations such as ball burnishing. Grav-i-Flo compounds change chip surface from finishing to cutting in minutes—parts need not be transferred from cylinder. Grav-i-Flo de-burring chips are obtainable for all de-burring needs on both ferrous and non-ferrous metals.



MODEL 48-2



Cam locks on doors have manually released safety stops for pressure relief.

New Grav-i-Flo machines are available in three sizes: cylinder size 36" x 40" dia.; 48" x 40" dia.; and 66" x 40" dia. Compartments furnished ½" plate unlined or ¼" plate rubber lined. Cam lock doors have manual release safety stops. Reduced voltage control on magnetic starter. Lever or push-button switch. Limit switch on safety guard. 220-440 volt, 3 phase, 60 cycle motor with magnetic brake. Water attachment with hose. Counterbalanced safety guard. Hoist pan has tubular yoke with manually operated lock. All standard equipment. Variable speed drive and timer controls optional.

Motor Driven Separator—welded frame supports hoist pan. Separating screen, adjustable from 0" to 1½", accommodates various sizes and types of parts. Screen inclined 5° maximum. Pan shelf provided for stock pan. One HP 220-440 volt, 3 phase, 60 cycle motor with speed reducer, and manual starter with overload protection.

Samples Processed Free! Grav-i-Flo sample processing department will gladly tell you how to attain a better finish at lower costs. Send samples to distributors or direct to Grav-i-Flo Corporation.

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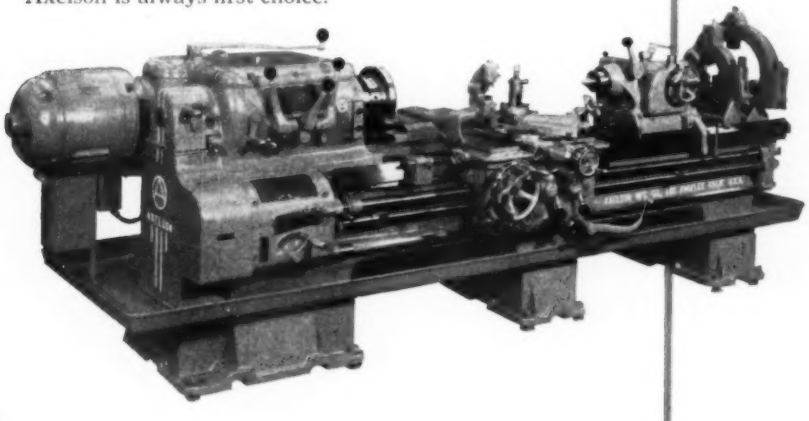
FIRST CHOICE
in heavy duty engine Lathes

For over a third of a century Axelson heavy duty engine lathes have been first choice of production executives.

Axelson lathes produce more work of higher quality with fewer rejects at lower unit costs... and more net profit per dollar of capital investment. Long experience of users proves it pays to choose Axelson — that's why Axelson is always first choice.



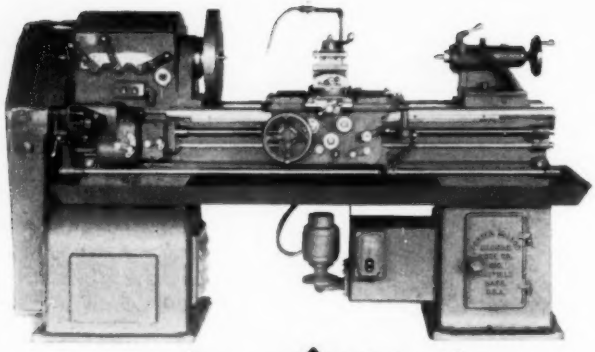
AXELSON *Lathes*

THERE IS NO ECONOMICAL SUBSTITUTE FOR QUALITY

DEPENDABLE FOR OVER A THIRD OF A CENTURY

AXELSON MANUFACTURING COMPANY Los Angeles 58, New York 7, St. Louis 16, Tulsa 1

Authorized distributors in all principal industrial centers



FOR IMMEDIATE DELIVERY

A few of the famous 16" swing Porter-McLeod engine lathes are now available for prompt shipment.

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How "Value Analysis" provides a practical, Fundamental approach to the problem of lower cost production.

Send for your copy of "How To Cut Costs With Value Analysis," now available in reprint form.

Reprints of this helpful *AMERICAN MACHINIST* Special Report are available at 15 cents each, or 13 cents each in quantities of 100 or more.

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SPEEDYLECTRIC

STEAM-JET CLEANERS

JC-30 JC-20 JC-10

Speedylectric Cleaning:

- speeds preventive maintenance inspection
- shows up that casting crack before it's too late
- speeds up the repair job
- boosts morale — boosts production
- insures clean, sterile washrooms
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Learn about the latest developments in industrial finishing. Write for details on steam spray painting. Ask for Bulletin 51B.

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Image Grinding

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New, but proven, Visual-Grind combines the image, profile and templet techniques in one machine, greatly broadening the scope of contour grinding. Carbide tungsten work-pieces, heretofore most difficult, are easily handled. The image technique readily grinds work-pieces whose shank diameters are larger than the contour ends. The templet method handles jobs too large to magnify on the screen. New possibilities...enormous savings... extreme accuracy!

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VISUAL GRIND

THE CLEVELAND GRINDING MACHINE CO.

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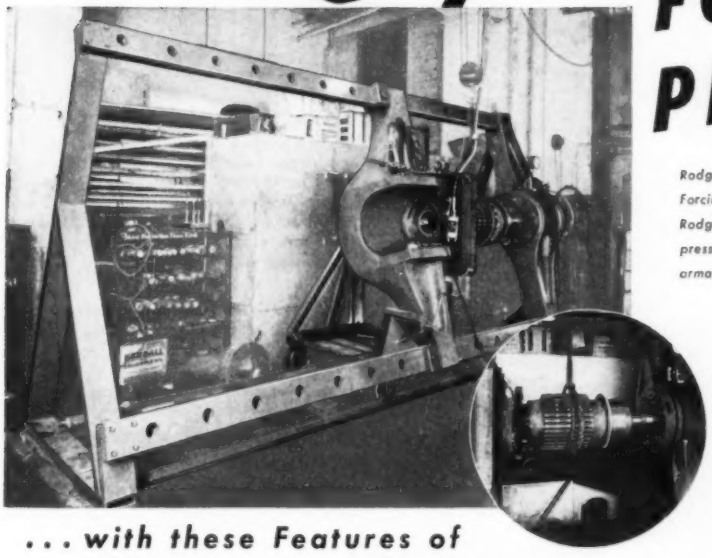
For Fast, Efficient Pressing Bending, Forming, Straightening...

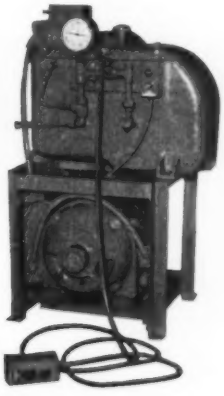
New Rodgers FORCING PRESSES



Rodgers 300 Ton, 75° Inclined, Stationary Forcing Press, one of many in the complete Rodgers line. In the application shown, the press is being used efficiently to press an armature shaft.

...with these Features of Construction and Operation

- **SEPARATE PUMPING UNITS**—Choose from individual hand-operated or power-driven pumps to operate any model Rodgers Forcing Press.
- **REMOTE CONTROL OF POWER PUMPS**—Operator can control press from any desired position.
- **REMOVABLE HYDRAULIC CYLINDER**—Cylinder is easily removed from head member to permit servicing or use for other power applications.
- **INDIVIDUAL FRAME UNITS**—Tracks, tension bars, abutment member and head member are all separate units to facilitate handling and erection of press.
- **EXPERTLY ENGINEERED AND CONSTRUCTED**—All units of Rodgers Forcing Presses are made strong, durable and dependable to give years of reliable service.



... Separate Power Pump

Select your press operating unit from hand-driven pumps or power-driven pumps. Shown is a Rodgers 2-cylinder Power Pump with remote control.

... In these Types and Sizes

Rodgers Versatile Forcing Presses are available in portable or stationary models—horizontal, vertical, 75° or 90° inclined—100 to 600 tons—with hand-operated or power-driven pumps. In this broad selection, you'll find the ideal press to meet your requirements.

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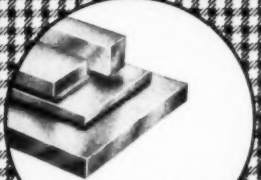

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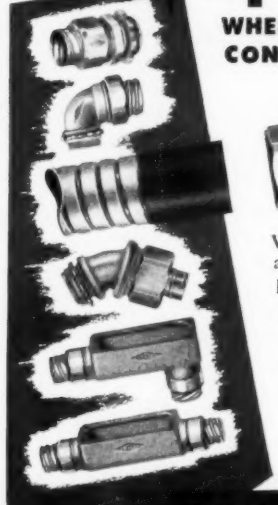
WHERE OIL AND VAPOR TIGHT CONNECTIONS ARE REQUIRED



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OVER 48 YEARS IN BUSINESS

SPS STANDARD PRESSED STEEL CO.
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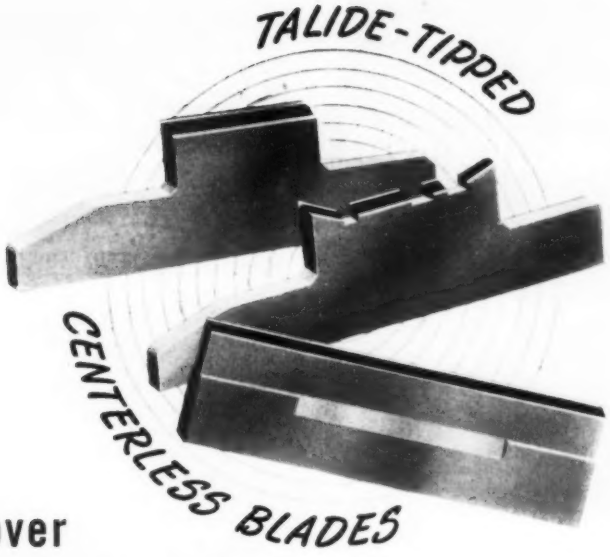
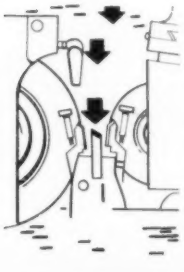


over 1,000,000 PIECES per grind

1,000,000 pieces per grind! This long service life means continuous operation, less scrap, less down time, lower unit cost. On most applications, **Talide Tungsten Carbide Blades stay on the job 50 to 75 times longer than other blades.**

Remember, the Talide Carbide insert is a solid strip without sections or lines or seams to score the work.

Not only do we manufacture standard blades, we design and make form or step blades for use in grinding parts with multiple diameters, steps, tapers, contours, or other special shapes.



Learn now about longer service life of Talide Centerless Blades. Twenty-four hour delivery from warehouses in Newark, Youngstown, Detroit and Chicago. Write for Catalog 48WP complete with prices, sizes, specifications. Forward part or drawing for estimate.

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METAL CARBIDES CORPORATION
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METAL CARBIDES CORPORATION

YOUNGSTOWN 5, OHIO *Pioneers in Tungsten Carbide Metallurgy*

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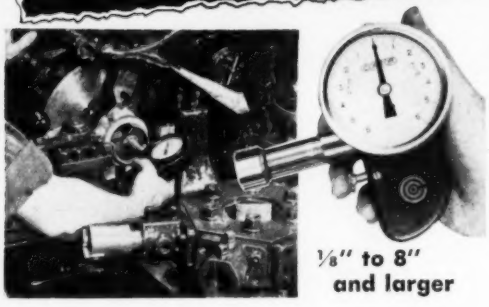
Get a higher percentage of acceptable work in producing PRECISION HOLES



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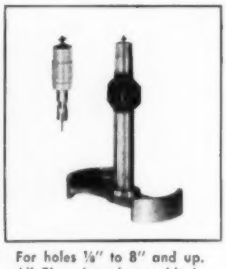
Amazing improvements in volume of production and precision of holes are on record as a result of giving machine operators COMTORPLUG. This unique hand gage, enables operator to keep machine adjusted better. Automatically and positively assures correct gaging to fractions of .0001". Detects out-of-round, tapers, bell mouth, etc. COMPLETELY AND POSITIVELY ACCURATE IN HANDS OF RELATIVELY UNTRAINED PERSONS—AT MACHINE OR INSPECTION LINE. Applicable to work still in chuck if desired: shows actual size—just right for Statistical Quality Control. THE Answer to war conditions, involving great urgency, green help, rough handling of gages.

Inspecting highly critical hydramatic propeller hub distributor valve.



For holes ¼" to 8" and up. All Plugs interchangeable in Amplifier.

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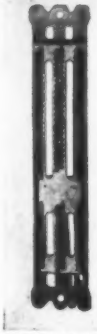
SHOW US A JOB THAT Zagar GEARLESS DRILLHEADS WON'T DRILL!

Unlimited number of spindles! Zagar's gearless principle permits spacing of holes as close as twice drill diameter. Any pattern or arrangement. Any material—steel, glass, plastics, acoustical tile, etc. Zagar drillheads can be mounted on a conventional drill press or built as complete units. Up goes production, down comes cost! We'd like to see your part drawing, please.



Ask for Catalog A-1.

Gas burner—385 holes drilled at one pass on 5/16" centers.

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Zagar TOOLS FOR INDUSTRY and SPECIAL MACHINERY

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the ONE hoist with ALL the advantages

You can save power, labor and time with a new ElectroLift worm drive hoist. One man handles up to 6 tons . . . smoothly, quietly, quickly, safely and economically. Push-button operation gives perfect control.

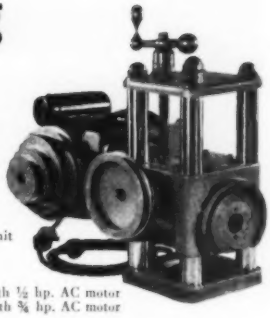
Choose from a wide range of models for any plant purpose. Call your ElectroLift representative listed in the classified telephone directory. Or write to:

WORM DRIVE ELECTROLIFT HOISTS

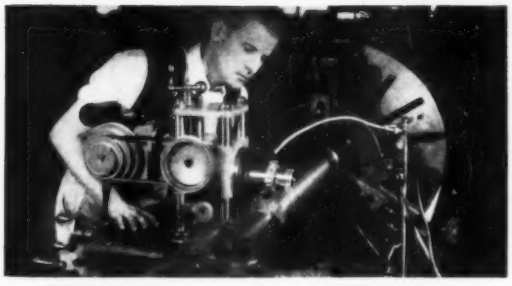
ELECTROLIFT, INC., 30 Church Street, New York 7, N. Y.

Four new opportunities for you to lower costs in precision machining

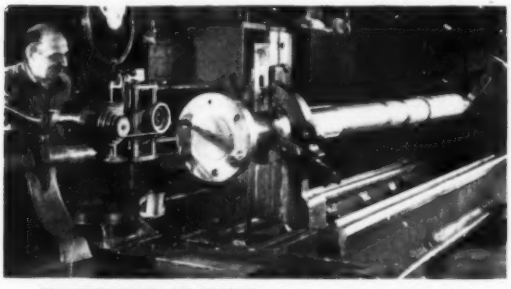
...with VERSA-MIL →



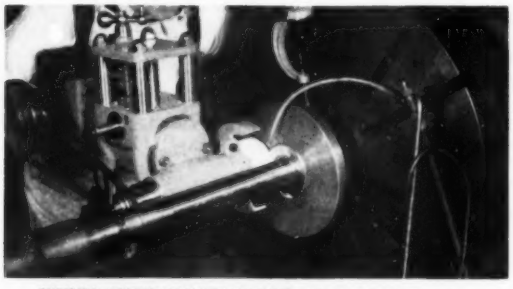
Versa-Mil Power Unit
6" travel on posts
#3 Morse taper
6" x 6¾" base
Weight: 89 lbs. with ½ hp. AC motor
104 lbs. with ¾ hp. AC motor



MILLING KEYWAY: Milling ¾" x ⅜" keyway in cold rolled shafting at rate of 1" per min. 3" cutter at 98 rpm. 30" swing lathe, ½ hp. motor



OFF CENTER BORING AND DRILLING: Complete machining of coupling flange of propeller tail shaft without removing work from the lathe. Time saved—65%



GRINDING BEARING SEAT AND SHOULDER: Cylindrical and rotary surface grinding in one set-up with 4" x 1¼" cup wheel.

With a Versa-Mil mounted on your machine tool, you can now handle *almost any precision job* . . . with savings in handling, preparation and set-up time that provide significant shop economies.

Versa-Mil helps cut costs in milling keyways, faces, splines, gears, threads . . . in drilling, reaming, boring and routing . . . in all kinds of external and internal grinding on cylindrical, taper and flat surfaces. It points the way to new profits in—

(1) **PRODUCTION:** Combining with lathes, planers, boring mills, horizontal millers and vertical turret lathes or fixtures to make special-purpose tools.

(2) **HEAVY MACHINING:** Reducing handling, preparation and set-up time.

(3) **PLANT MAINTENANCE:** Serving as a portable machine tool taken to the work instead of bringing the work to the shop. Saves disassembly, transportation and down-time.

(4) **SMALL SHOPS:** Taking the place of costly machine tools.

We'd like to tell you more of the substantial contribution Versa-Mil can make to lowering your machining costs. Please write for further information. It will merit your careful consideration.

VERSA-MIL COMPANY
30 Church Street, New York 7, N. Y.

USERS OF VERSA-MIL read like the "blue book" of industry. The following companies indicate the diversity of businesses Versa-Mil is now serving:

American Can Co.
General Electric Co.
International Harvester Co.
New York Central Railroad
Otis Elevator Co.
Phelps Dodge Copper Products Corp.
Fairchild Engine & Airplane Corp.
Standard Oil Co. of New Jersey
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VERSA-MIL

The Tool for Precision Milling, Drilling and Grinding

STELLITE Alloy Tools

machine steel on a mass-production Basis...

With less failure from Chipping

Rear axle housings, like the one sketched above are being machined at the rate of one a minute by HAYNES STELLITE 98M2 metal-cutting tools. This production schedule is maintained with a minimum of tool chipping, even though the operation is complicated by the size and shape of the parts.

This SAE 1010 steel housing vibrates in the lathe as it runs at a rate of 287 revolutions per minute. In addition, the stock on the barrel and flange is not even. This variation in metal thickness creates an uneven cutting action, which subjects the turning and facing tools to additional shock.

This is one of those rugged jobs that HAYNES STELLITE tools take in their stride . . . the tools that cut efficiently at red heat and have a good balance of hardness, edge strength, and toughness. You'll find HAYNES STELLITE tools will lower your costs, because they can take heavy cuts with coarse feeds at high speeds.

Write for the booklet, "Operating Information" which gives the recommended cutting angles, speeds and feeds, and grinding wheels for HAYNES STELLITE 98M2 tools. It is available from our general sales office in Kokomo, Indiana, or any of the district sales offices listed below.

The cutting tools used to machine this rear axle housing are described in the table below.

Tool	Operation	Surface ft. per min.	Depth of cut, in.*
A	Facing	328**	1/16 to 1/8
B	Chamfering	328	....
C	Facing	328**	1/16 to 1/8
D	Turning	254	0 to 1/8
E	Turning	328	1/16 to 3/16
F	Chamfering	328	1/64 to 1/32

*Variation due to non-uniformity of stock

**A diminishes to 213 S.F.P.M.; C to 254 S.F.P.M.

HAYNES TRADE-MARK *alloys*

Haynes Stellite Division
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The terms "Haynes," "Haynes Stellite" and "Stellite" are trade-marks of Union Carbide and Carbon Corporation.

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The exclusive Procunier "Tru-Grip" tap holder is lighter, smaller in diameter. It affords easier tapping close to walls or shoulders, eliminates "chewed" tap shanks. Holds tap true.

with this Procunier High Speed Tap Head

Today you must **speed** up your **production** schedules . . . and at the same time **reduce spoilage!** The Procunier High Speed Tapping Head is precision-built for faster, consistently accurate production tapping. A host of exclusive Procunier features enable you to maintain cleaner, sharper threads . . . with fewer broken taps, fewer spoiled pieces — even on accelerated production runs.

HERE'S WHY: Tap driving pressure is **automatically regulated** by the amount of pressure applied to the unique Procunier friction clutch. Operators quickly learn to detect dull or "loaded" taps just by the pressure needed to drive them! This increased sensitivity enables even "green" operators to do more accurate tapping. "Blind" hole tapping may be done as easily as through tapping! WRITE TODAY for brochure giving full details and specifications on Procunier High Speed Tap Heads.

Also Available—

NEW! Procunier "TAP KING" for **large hole** tapping. Capacity ⅜" to 1" in steel; 1⅛" in softer metals.

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2 IN YOUR PLANT WE INSTALL THIS METHOD, *GUARANTEEING* YOU THE SAME RESULTS, ON VOLUME PRODUCTION.

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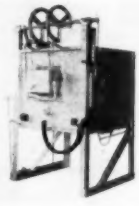
Molybdenum steels will again become widely used. We have licked this problem already. Ask us.



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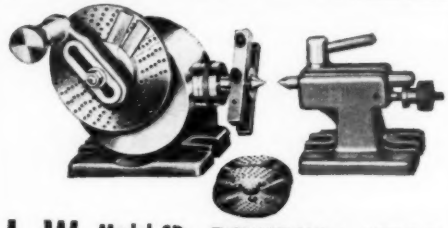
O. S. WALKER CO. Inc.

WORCESTER 6, MASSACHUSETTS

Original Designers - Builders of Magnetic Chucks



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Ideal for smaller Milling Machines. Spindle Threaded 1½"-8 to fit L-W 5" Universal Chuck.

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Heavy duty headstock and tailstock designed for maximum rigidity. Alloy steel threaded headstock spindle with extra large tapered bearing and takeup adjustment collar. Head tilts to 90° in vertical position. Alloy stress-proof steel worm and accurately cut worm wheel cut to close limits for accuracy. Ball bearing thrust and adjustable for end play. Complete with three index plates for dividing all numbers to 50 and even numbers to 100, except 96T. Index chart shows all divisions obtainable to 380. Right or left hand models.

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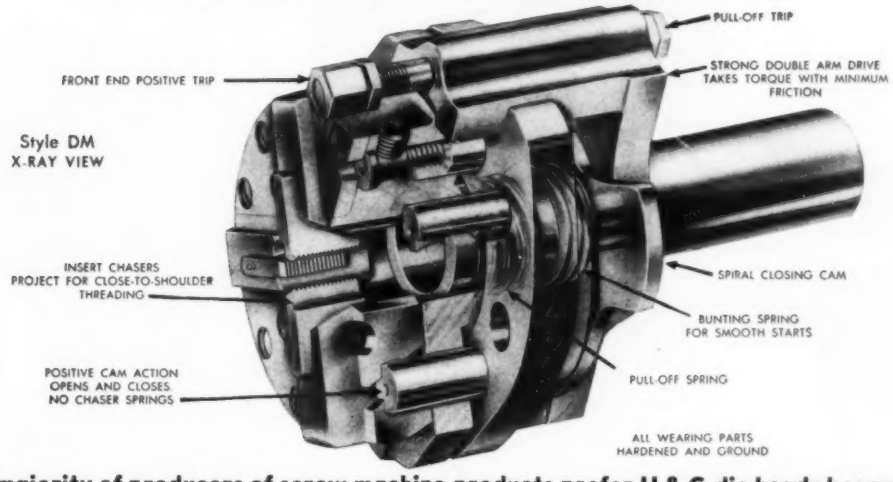
H&G Insert Chaser DIE HEADS

simple, positive, cam-action

for new high threading speeds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The majority of producers of screw machine products prefer H & G die heads because—

(1) Positive tripping opens chasers at exact length of thread.

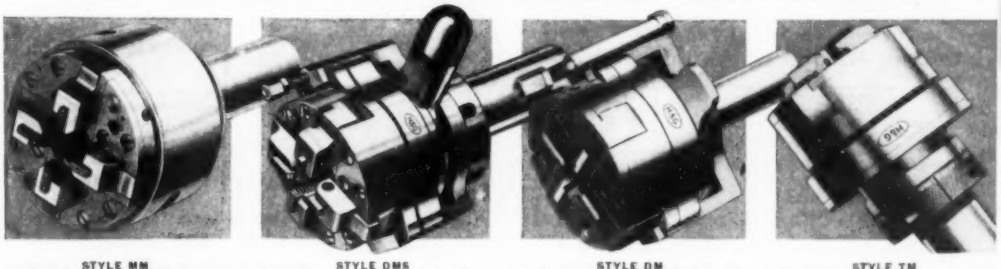
(2) Simple way of changing chasers. Operators do it without aid of set-up man.

(3) The same set of chasers can be used in many sizes and styles. This, together with low cost of chasers, simplifies and reduces inventory.

(4) High quality of threads, smooth finish and accuracy to Class III fits.

(5) Difference in low cost insert chasers and conventional types . . . accounts for large part of the profit on highly competitive jobs.

SIZES AND STYLES FOR ALL TYPES OF MACHINES ON WHICH THREADS ARE CUT



STYLE MM
For threading on multiple spindle automatics, viz.: Gridley, National Acme, New Britain, Cone, Greenlee, Davenport; any machine that ROTATES the die head—chucking machines, bolt threaders, drill presses, etc.

STYLE DMS
For cutting threads on turret lathes, hand screw machines and similar type machines which ROTATE the workpiece, holding the die head STATIONARY.

STYLE DM
Especially designed for cutting threads at new high speeds on Brown and Sharpe automatics, Cleveland single spindles, etc. Positive, instant tripping and long-run dependability at high indexing speeds.

STYLE TM
For superior quality taper-cut pipe threads. Chasers recede at a definite rate. Die head opens instantly when exact length of thread is cut, leaving no tell-tale marks on the threads.

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☐ "Selecting the Proper Die Head for the Job" ☐ Style MM ☐ Style DMS ☐ Style DM ☐ Style TM

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General Purpose Die Heads. Threaded Rods. Threading Machines.

On cut-off jobs . . .

You benefit 4 ways with Wells Saws

1. Fast, continuous cutting action.
2. Greater accuracy on each job.
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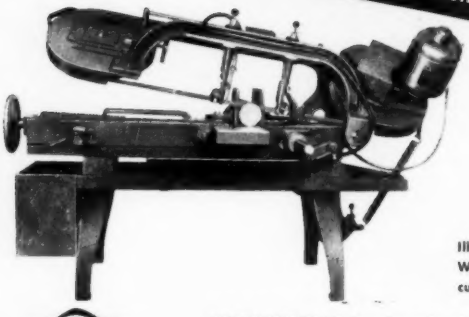
4. Greater overall economy.



Illustrated is the popular Wells No. 8 with wet cutting system.

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HORIZONTAL band sawing is the modern, cost-cutting way to handle cut-off jobs . . . and Wells Saws are the leaders among horizontal metal cutting band saw machines. Simplicity of design means fewer moving parts and easy operation. Ruggedly built to increase productivity and reduce cutting costs, a Wells Saw pays for itself quickly and will give you years and years of dependable, satisfactory service.

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MODEL	49 A	No. 5	No. 8	No. 12
Capacity in inches: Rounds	3½	5	8	12¾
Rectangular	3½ x 6	5 x 10	8 x 16	12 x 16
Blade speeds, ft. per min.	54, 100, 190	60, 90, 130	60, 90, 130	50, 100, 150
Motor Size	1/6 H.P.	⅓ H.P.	½ H.P.	¾ H.P.
Floor Space, in inches	16½ x 38	21 x 50	24 x 72	32 x 78
Wet cutting system	No	Yes	Yes	Yes

Automatic stock projection available for Nos. 8 and 12.

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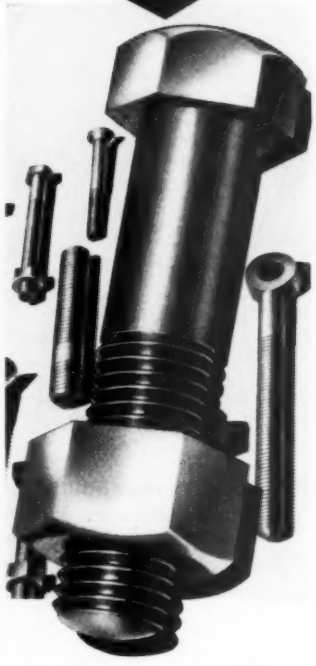

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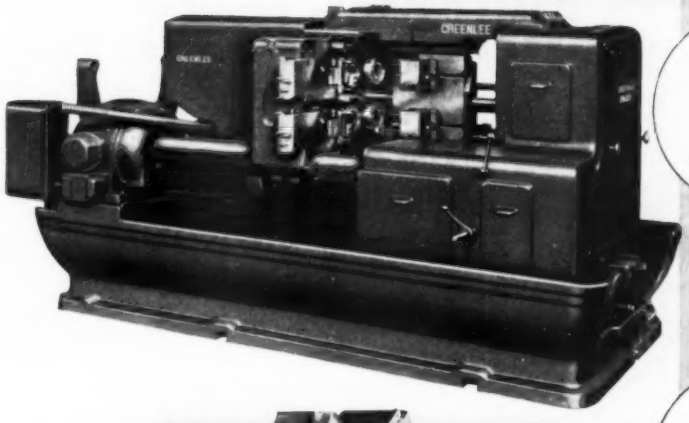
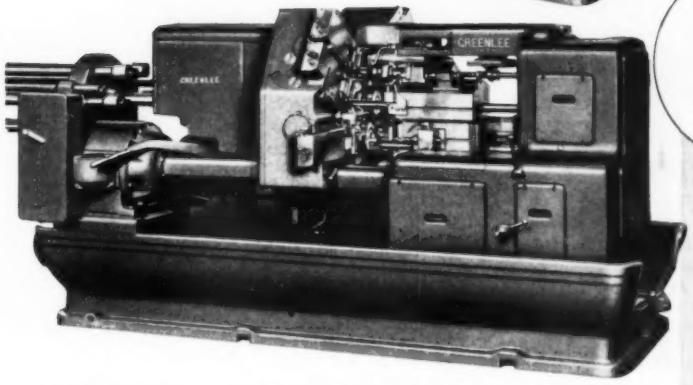


4 SPINDLE

HEAVY DUTY "FOUR"

Made in 1⅝" and 2⅝" spindle capacities for all types of heavier work suitable to four-position machining. Includes all cost-cutting features of the versatile "Six".



6 SPINDLE

WIDE RANGE "SIX"

Made in 1", 1⅜", and 2" spindle capacities to cover the majority of work normally assigned to screw machines. Handles a wide variety of set-ups efficiently and economically.

VERSATILE, EFFICIENT, ECONOMICAL

Greenlee Automatics have made a name for themselves in forward-looking production shops . . . not only for their exceptional versatility, but also for their cost-cutting efficiency particularly on change-overs, and for other economies possible to achieve with them. Adaptations of standard models are available . . . for second-operation work . . . for tooling extra-long work pieces . . . for multiple feed-out . . . for air feed to eliminate pusher marks, etc. Send us prints or sample pieces. *Let our engineers show you how profitably Greenlees can be applied to your production.*

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UNIVERSAL TOOLING — Tool holders fit any cross-slide cavity . . . are easily and quickly changed . . . reduce equipment costs.

INTERCHANGEABLE CAMS — Can be changed at will without re-adjustment of tools and holders. Cam storage is held to a minimum . . . cam costs greatly reduced.

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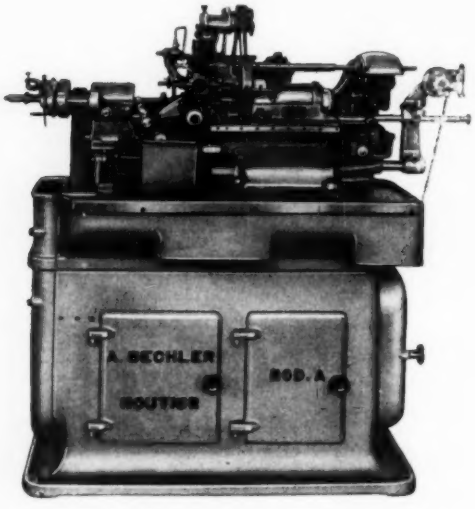
LARGE TOOLING AREA — Permits using many timesaving, cost-cutting auxiliaries that often eliminate second operations.

MULTIPLE-SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC SCREW MACHINES • AUTOMATIC TRANSFER PROCESSING MACHINES

MEET HIGH PRECISION *DEMANDS*
with
BECHLER SWISS AUTOMATICS



Model A-10 BECHLER AUTOMATIC has 3/8" diameter capacity, 2¾" turning length, 5 cross tools. This Automatic is equipped with single spindle threading attachment and slotting attachment for producing PRECISION SCREWS.

The advantages of using BECHLER AUTOMATICS to speed production:

1. Over 20 spindle speeds.
2. 88 camshaft speeds for each spindle speed selected.
3. More than 30 different attachments.
4. A new device prevents the breaking of carbide tools.
5. Easiest tool adjustments.

DIAMETER CAPACITIES

BECHLER AUTOMATICS

Model AS	5/64"	5/32"	9/32"	3/8"
Model A	—	5/32"	9/32"	3/8"
Model B	1/2"	5/8"	3/4"	—
Model C	1"	1¼"	—	—

BECHLER ISOMATICS

Automatics for constant and highly accurate production of very small parts.

Model AS	5/64"	5/32"	9/32"
Model A	—	5/32"	9/32"

OTHER BECHLER MACHINES . . . MODEL CF CAM SHAPERS • SIMPLEX AND DUPLEX PINION CUTTING MACHINES

ADDITIONAL SERVICES

- ATTACHMENTS, SPARE PARTS, CAMS available from New York Stock
- TOOLING SERVICES for planning layouts and set-ups and for making cams and tools

SEE THESE MACHINES IN OPERATION AT COSA'S NEW YORK SHOW ROOM OR SEND FOR DESCRIPTIVE LITERATURE.

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AT LEAST 18 FACTORY OILS CAN BE PROFITABLY CENTRIFUGED

Almost every metal-working plant has one or more operations where an adequate supply of clean, dry oil is a virtual necessity. 18 such applications are suggested at the left, and in every case a De Laval Oil Purifier provides the quickest, low-cost method of keeping these oils ***clean*** and ***dry***.

Clean oil is the prime requisite in most cases. Because of the greater intensity of centrifugal force, De Laval machines are more thorough than any other means. They remove every bit of dirt, abrasive or metallic particles. Thus, cutting oil can be used safely over and over again, with increased tool life and possible less dermatitis among the men. Dies last longer when drawing oil is centrifuged; tests are more reliable when testing oil is purified.

Dryness can be a most vital consideration, as in the case of slushing compound purification. Here, too, De Lavals do the best work, quickest and most thoroughly. Water removed from the oil is continuously discharged—cannot possibly lead to recontamination.

- ***Bulletin MM-1 gives additional details. It will pay you to send for it.***

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DRAWING OIL
ENGINE OIL
GRINDING COOLANT
HONING OIL
HYDRAULIC OIL
LUBRICATING OIL
MOTOR BLOCK TEST OIL
QUENCHING OIL
RECOIL OIL
SHOCK ABSORBER OIL
SLUSHING OIL
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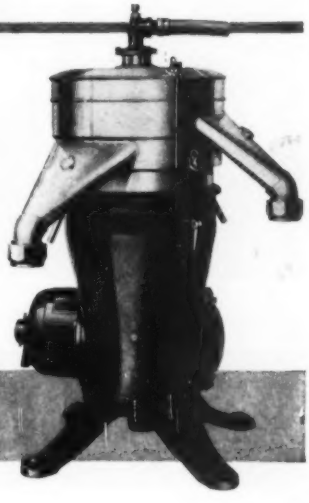

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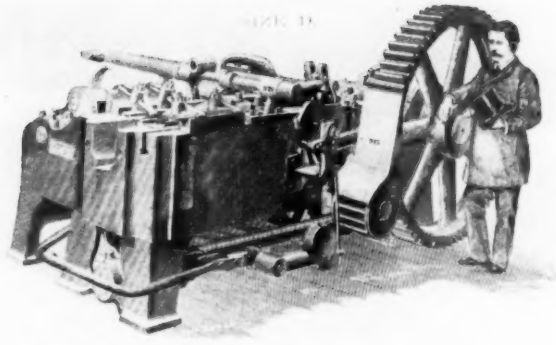
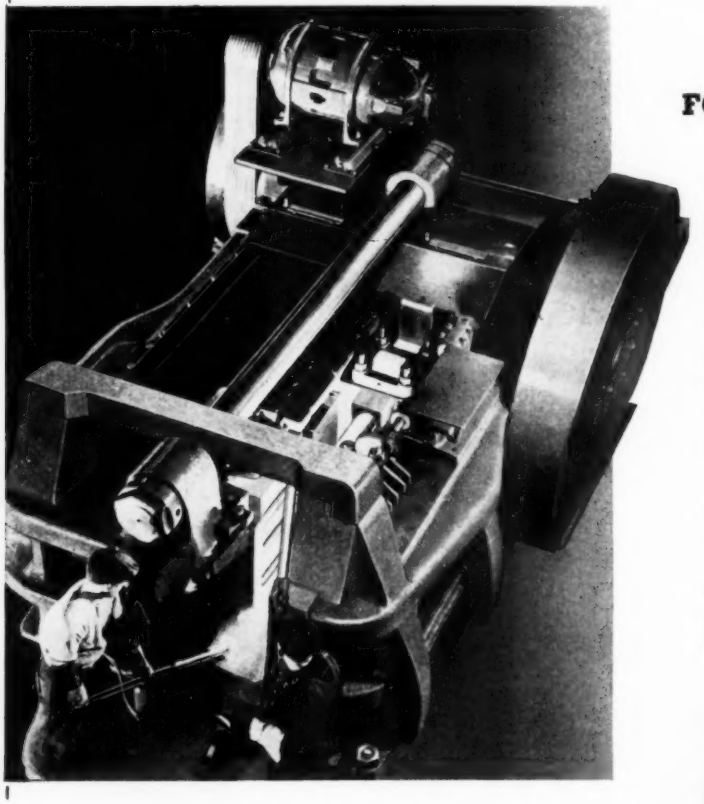


Mr. J. R. Blakeslee, founder of the Blakeslee Machine Co. (AJAX since 1894) stands beside the first 5" Forging Machine. Patented in 1889.



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The urgent demands of industry in War and Peace, the supreme achievement of engineering skill, the use of the best materials have produced a superior product geared to the needs of the times. AJAX Forging Machines have excelled in performance throughout the years.

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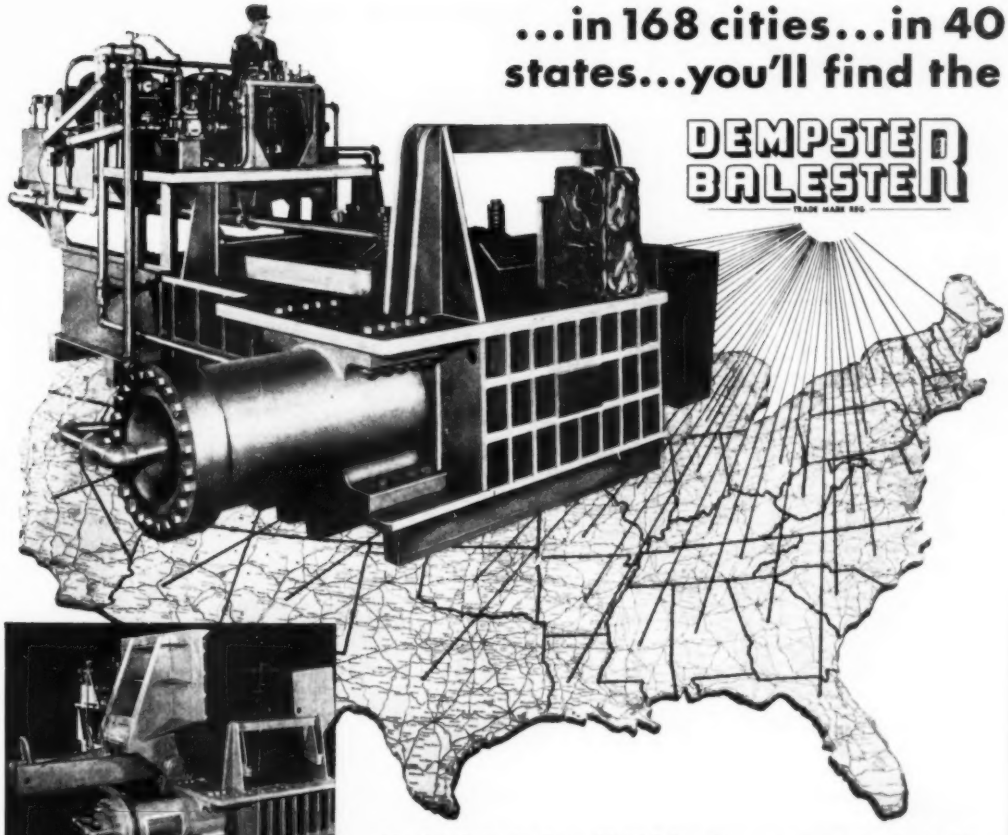
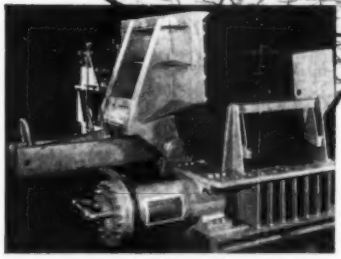
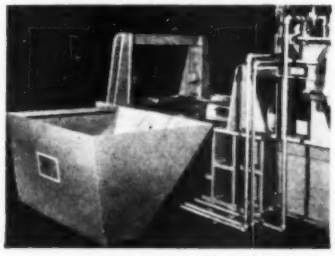




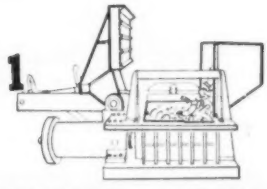
Skip-Pan Loader in unloading position with Auxiliary Compression Door ready for compression stroke.

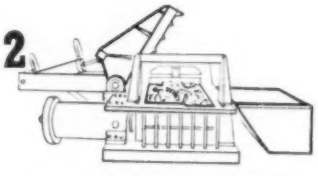


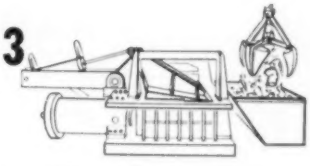
Skip-Pan Loader in re-loading position, while Auxiliary Door compresses scrap.

The first Dempster Scrap Metal Baling Press was manufactured only 10 years ago. Today you'll find them throughout the nation. . . in 168 cities. . . doing a production job that only the "Balester" can do for efficiency and low cost. Here is the "600" that turns out bales at an approximate rate of 6 to 7½ tons per hour. With Auxiliary Compression Door, it is the nearest thing available to "Automatic" baling. Every phase in the baling cycle is operated by hydraulic controls.

Shown below is the 1-2-3 production punch with Skip-Pan Loader and Auxiliary Compression Door. 1. Skip-Pan dumps metal into charging box. 2. Door begins stroke and Skip-Pan returns to loading position. 3. Door compresses scrap with a 45-ton force while Skip-Pan is re-loaded. The Auxiliary Compression Door completely eliminates in most operations, and materially reduces in others, the cost of tying up two or three extra arrangers. The Dempster-Balester is built in four models, with capacities from 2 to 7½ tons per hour. If you are interested in baling scrap metal, see a Dempster-Balester in operation near you. Write for nearest installation. A product of Dempster Brothers, Inc.







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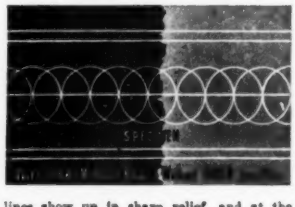

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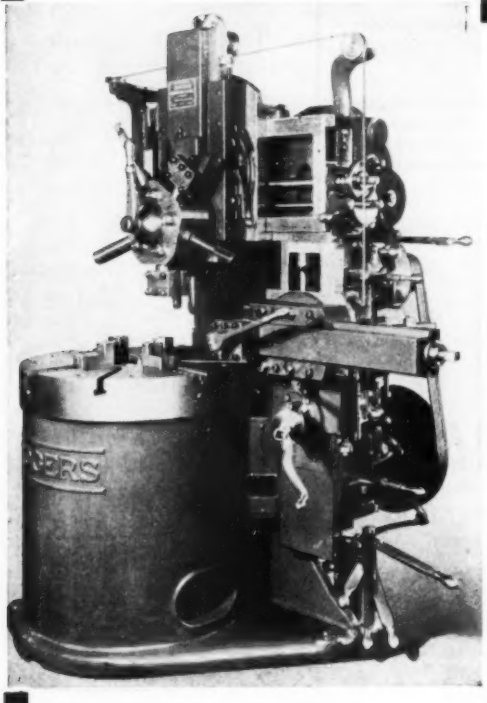

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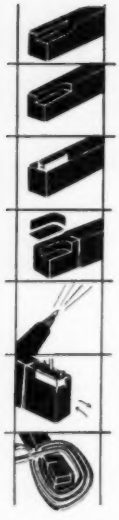

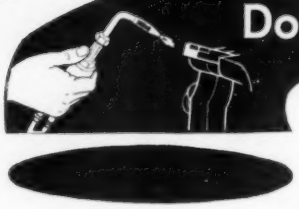

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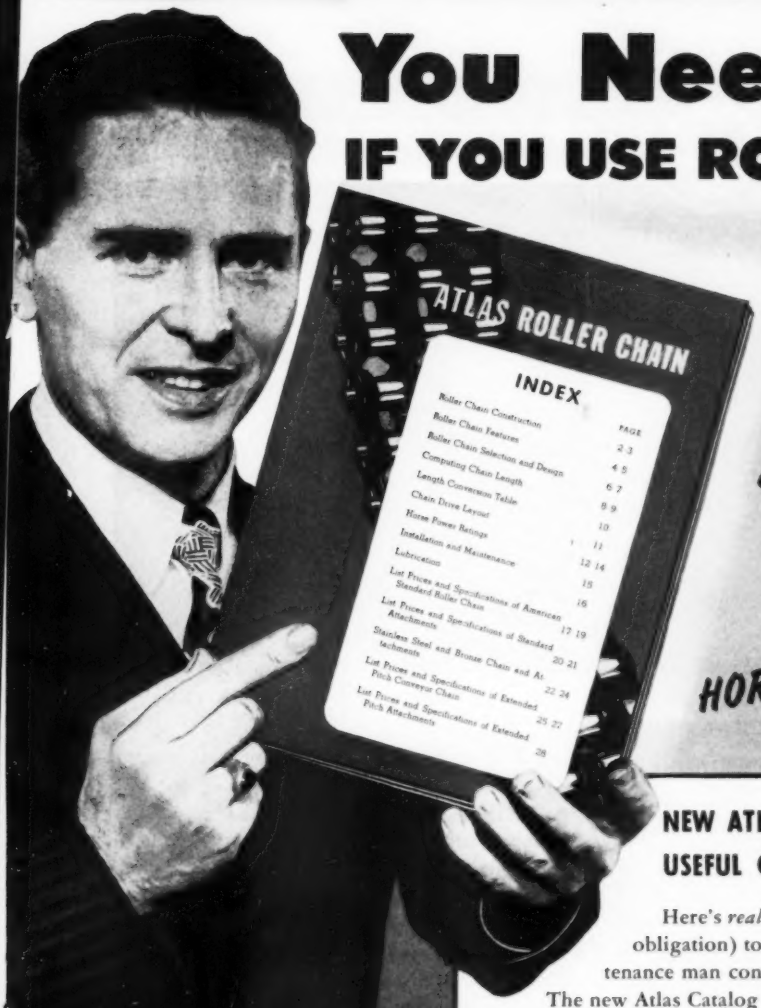
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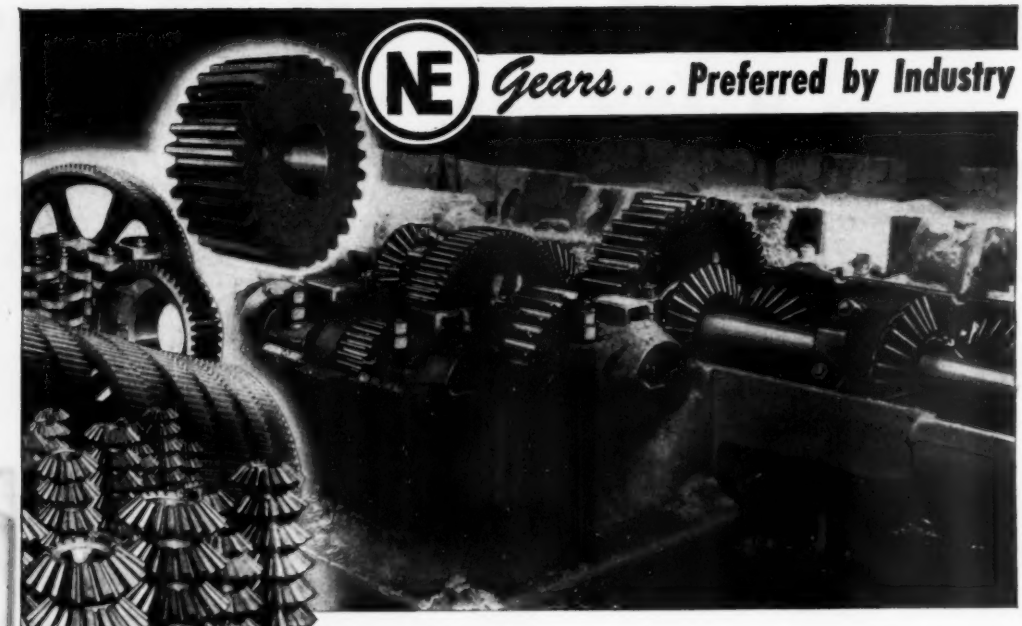

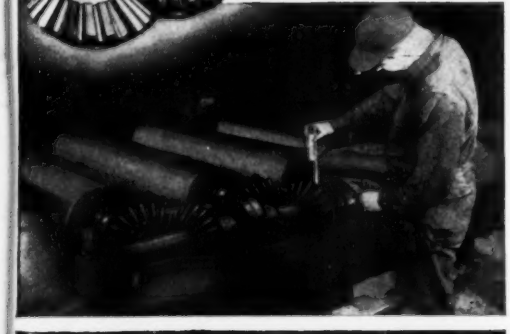

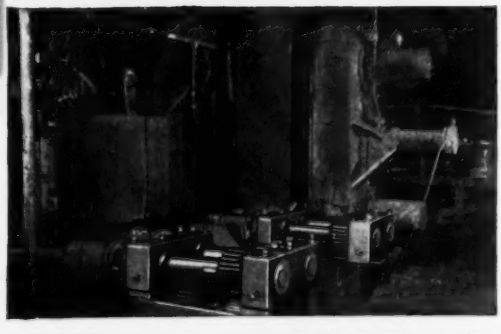

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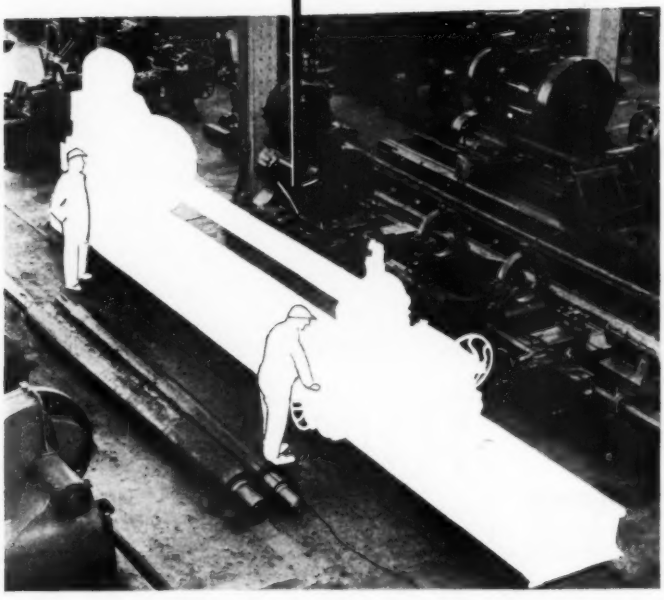

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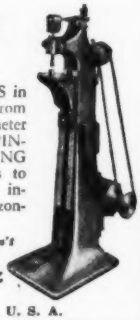

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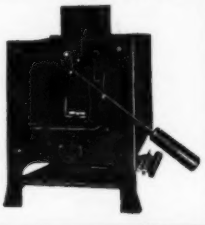

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JANUARY 22, 1951

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Precision MACHINE

BY THE

This view shows a battery of five BULLARD mult-au-matics being disassembled, so that all parts can be properly checked — *(worn or broken parts are replaced, slides rescraped and fitted to "new-tool" accuracy).*

This view shows a machine table being reground to "new-tool" accuracy

This view shows checking for spindle alignment during the course of reassembly

This view shows a late model SELLERS planer being assembled—

(our facilities are large enough to handle from the largest to the smallest machine tool).

This view shows a small battery of machine tools in the process of being reassembled

(All reconditioned machines are stripped to their bare frames—rebuilt from the bottom up).

SPECIAL NOTE TO WAR CONTRACTORS

Should the Government deliver machine tools to you from Government Reserves, our facilities are available to convert the equipment to "new-tool" accuracy.

MOREY

TOOL REBUILDING

COUNTRY'S FOREMOST REBUILDER

Rebuilders for more than 35 years

100,000 sq. ft. of floor space

Your present equipment can be REBUILT to NEW-TOOL ACCURACY to meet present-day exacting productivity demands by

AMERICA'S FINEST REBUILDING FACILITIES

In a modern, well-equipped plant, set up *exclusively* to recondition machine tools, with more than 40 years of experience and "know-how" at your service!

OUR REBUILDING METHODS

A machine is stripped to its bare frame—all worn or broken parts are replaced, ways replaned and when necessary ground or hand scraped; the machine is carefully reassembled and realigned so that when it is put "in line" it will function for all practical purposes LIKE NEW—*Our unconditional GUARANTEE eliminates any* element of risk.

A cordial invitation is extended to you to pay us a visit to INSPECT our facilities!

PERFORMANCE COUNTS . . .

Over these many years we have REBUILT thousands of machine tools from the smallest to the largest not only for resale but for most of America's leading manufacturers.

NOW IS THE TIME . . .

Deliveries on new equipment are very long—Why lose any time when you can put your present equipment into equal-to-new condition and have them in production for you.

This name plate means the acme of tolerances.

MACHINERY CO., Inc.

406 BROOME ST., NEW YORK 13, N.Y.

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CABLE ADDRESS: WOODWORK, N.Y.

Beaver·Bilt ★

Brown & Sharpe Automatic Screw Machines

Guaranteed to Operate the Same as New

THE FOLLOWING LATE TYPE, HIGH SPEED BROWN & SHARPE AUTOMATIC SCREW MACHINES ARE NOW IN STOCK FOR IMMEDIATE DELIVERY

2—No. 0G H.S. Serial Nos. 9434 (1940); 10349 (1943), Swing Stop, ¾" Spindle Cap., 4150 R.P.M. Spindle Speed, Motor in base. Beaver-Bilt.
1—No. 2G H.S. Serial No. 7084 (1937), Swing Stop, 1⅛" Spindle Cap., 2400 R.P.M. Spindle Speed, Motor in base. Beaver-Bilt.
2—No. 2G H.S. Serial Nos. 8519 and 8775 (1940), Swing Stop, Vertical Cutoff Slide, 1¼" Spindle Cap., 3000 R.P.M. Spindle Speed, Motor in base. Beaver-Bilt.
1—No. 2G H.S. Serial No. 10311 (1943), Swing Stop, Vertical Cutoff Slide, Silent Stock Support, 1½" Spindle Cap., 2150 R.P.M. Spindle Speed, Motor in base. Beaver-Bilt.

Each of the above machines is Beaver-Bilt and complete with the following standard equipment—Standard Capacity Feed Tube—Front and Back Circular Tool Posts—Work Pan—Wrench Rack—Turret Hand Lever—Full set of Feed Change Gears—Full set of Spindle Speed Change Gears—Stock Stands—Complete set of Oil Splash Guards.

TRADE-IN SPECIALS IN GOOD OPERATING CONDITION AT A FRACTION OF ORIGINAL COST

1—No. 00G Standard B. & S. Automatic Screw Machine Serrial No. 11391 with Motor in base and standard equipment. Very good condition.
1—No. 0 Standard B. & S. Automatic Screw Machine Serial No. 5263 with standard equipment. Fair condition.
2—No. 0 High Speed B. & S. Automatic Screw Machines Serial Nos. 6320, 6513, and 7940 with Swing Stops, Turner Motor Drives, also standard equipment. Very good condition.
1—No. 0G Standard B. & S. Automatic Screw Machine Serial No. 4569 with motor drive and Screw Slotting Attachment, also standard equipment. Very good condition.
1—No. 0G Standard B. & S. Automatic Screw Machine Serial No. 7300 with motor in base, Screw Slotting
1—No. 2 Attachment, and Standard equipment. Very good condition.
1—No. 2G Standard B. & S. Auto. Screw Machine Serial No. 437 with standard equipment. Fair condition.
1—No. 2G Standard B. & S. Automatic Screw Machine Serial No. 4310 with Geared Head and Single Pulley Drive. Fair condition.
1—No. 2G Standard B. & S. Automatic Turret Forming Screw Machine Serial No. 2402 with Geared Head and Single Pulley Drive, also standard equipment. Very good condition.
1—No. 2G Standard B. & S. Automatic Screw Machine Serial No. 4586 with Geared Head and Single Pulley Drive with motor, also standard equipment. Very good condition.

OTHER FINE MACHINE TOOLS AND ATTACHMENTS

6— Elgin Precision Bench Lathes, 7" x 15" Capacity, complete with 4" Diameter Three Jaw Universal Chucks, Dog Plate, Face Plate, Draw Bar, Compound, Tail Stock, Grinding Attachments, 6 Foot Heavy Maple Benches, and Motor Drives with Motors. New 1945 and in excellent condition.
6— Hardinge Second Operation and Hand Screw Machines, Bench Type, with Collet Type Headstocks and Six Hole Turret Index Type Tail Stocks. New 1945. Excellent condition.
1— Vertical Cutoff Slide Attachment, complete, for No. 2G High Speed B. & S. Automatic Screw Machine. New never used.
1— Screw Slotting Attachment, complete, Belt Drive, for No. 0 High Speed B. & S. Automatic Screw Machine. New never used.
1— Turret Drilling Attachment, Motor Driven, for No. 0G High Speed B. & S. Automatic Screw Machine. In excellent condition.

*Not Just RE-Built — But BEAVER-BILT!

1. Beaver-Bilt Machines are *unconditionally guaranteed* to produce work to the same tolerances as a new machine of the same type.
2. Only genuine Brown & Sharpe replacement parts are used on Beaver-Bilt machines and no change is made from standard.
3. Beaver-Bilt Brown & Sharpe machines save you up to 50% of the cost of a new machine of the same type.
4. Each machine is properly skidded, crated, and loaded on a truck free of charge.

HERE'S THE BEAVER UNCONDITIONAL GUARANTEE

Any Beaver-Bilt or "as is" machine sold by us can be operated in your own shop for a period of 30 days and, if found unsatisfactory for *any reason whatsoever*, may be returned freight prepaid for a full refund of the purchase price.

We have specialized exclusively in the rebuilding and servicing of Brown & Sharpe Automatic Screw Machines for 15 years. You profit by this valuable experience.

USED AND REBUILT MACHINERY DIVISION **PHONE: SEEley 3-0680**

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Every Item Guaranteed as Represented

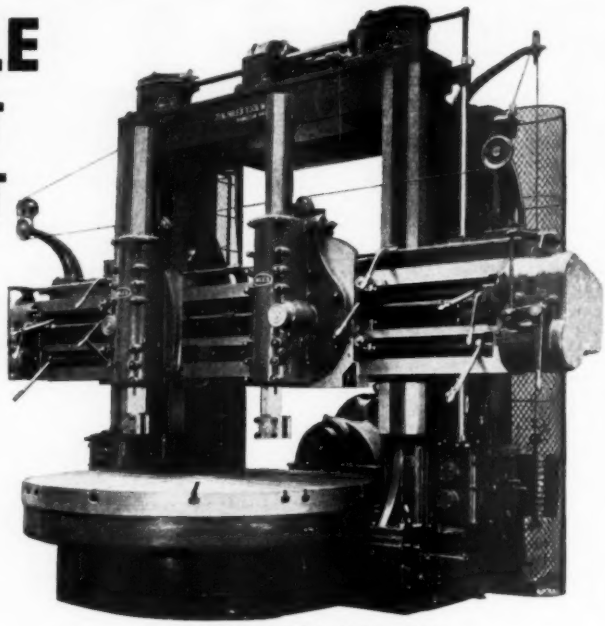
AUTOMATIC, #0 B & S Auto. Cut-Off 11/16" Cap
AUTOMATIC, 1¼" Four Spdle. Cone w Thrd. Spdle.
AUTOMATIC, Nat-Acme #C, 5-Spdle. 9/16".
AUTOMATIC, B & S #2 Wire Feed. 1".
AUTOMATIC, B & S #2, 1".
AUTOMATIC B & S #2G, 1".
BORING MILL, Niles B & P 120" Vert. 30 h.p.
BORING MILL, Colburn 72" Vert. Two heads.
BORING MILL, Colburn 60" Vert. Two Hds.
BORING MILL, Bullard 24" Vert. New Era Type.
BORING MILL, Gisholt 42" Vert. 220/440 volts.
BORING MILL, Lucas #3I Horiz. 3" Bar.
BORING MILL, Giddings & L. #0 Horiz. 3" Bar.
BORING MILL, Giddings & L. #32 Horiz. 3½" Bar
BORING MILL, Ryerson #11 Horz. 3" Cap. #6 M.T.
BORING MILL, Barrett #2 Horiz. Cyl. Borer. 5"
BORING MILL, Betts 78" Vert. Turning & Boring New in 1943. All Electricals.
BORING MILL, 61" Bullard MAXI-MILL. 2 Hds.
BORING MILL, #0 Giddings & Lewis, 3½" Bar. #3 M.T. 220/440 volts. TWO.
BORING MILL, Bullard 54" Vert. Spiral Drive. Sommer & Adams #20A Boring, Hobbing & Threading Machine. Timken Bearings. Swings 30" over bed. 18" cross feed, 42" longit. Carriage has rapid approach & return. Used to mill internal threads. Excellent Condition.
BOREMATIC, Heald #40 Sgle. End W/Univ. Fixture, 220/440 volts.
BROACH, Oilgear 10 Tons Horiz. 36" Str.
BUFFER & POLISHER, U. S. Electrical Multi-Speed Double End #95, 5 h.p., 220 volts.
SGLE. SPDLE. DRILL, Foodick 16" Bldg. Hd. #2
SGLE. SPDLE. DRILL, Barnes 24". #4 M.T.
SGLE. SPDLE. DRILL, Barnes 20". #3 M.T.
SGLE. SPDLE. DRILL, Buffalo #2MS, 26" #3 M.T.
SGLE. SPDLE. DRILL, Aurora 36" Brdg. #5 M.T.
SGLE. SPDLE. DRILL, Colburn #2 Mtg. #4 M.T.
TWO SPDL. DRILL, Leland Gifford 26". #2 M.T.
TWO SPDLE. DRILL, Leland Gifford 26". #2 M.T.
TWO SPDLE. DRILL, Leland Gifford #2LMS 26". #2 M.T. 11" c.c.
TWO SPDLE. DRILL, Leland Gifford #2MS 26". #2 M.T. 11" c.c.
DRILL, Avey-Matic #3 Hvy. 2-Spdl. #3 M.T. 24".
3—SPDLE. DRILL, Leland Gifford #2 MS—14". 11"
3—SPDLE. DRILL, Edlund #2B, #2 M.T. 16". 9½"
DRILL, L. Giffords #2MS 14". 11" C.C. 3-Spdle
4—SPDLE. DRILL, Leland Gifford 20". #2 M.T. 11"
4—SPDLE. DRILL, Demco #KT. #2 M.T. 24"
6—SPDLE. DRILL, Leland Gifford 14". #2 M.T.
DRILL, Cincinnati 21" Brdg. Drilling & Tapping.
DRILL, Radial, Cinci-Bick. 5' Arm. 13" Col. #5 M.T. 24 speed gearbox. 7½ h.p. 3/60/220.
DRILL, Baker #314 Hvy. Pattern High Speed Vertical Boring & Drilling Machine, 7½ h.p. 220/440 motor, #5 taper, 12 feeds, 6 speeds, 12¼" throat, 3" Capacity in steel.
DRILL, Leland Gifford #2LMS Upright Sliding Head Two Spindle, #2 taper, 13" overhang. Independent 230 volts, 4-speed motors, indicated spindle speeds.
RADIAL DRILL, Fosdick 5' Arm. 14" Col. #5 M.T.
RADIAL DRILL, Mueller 3½' Arm, 11" Col. #4 M.T. 220/440 Volts.
RADIAL DRILL, Cinci-Bickford 4' Arm, 13" Col. #5 M.T. 220/440 volts.
RADIAL DRILL, Cinci-Bickford 6' Arm. 15" Col. #5 M.T. 220/440 volts.
RADIAL DRILL, Carlton 4'-15". Motor Dr.
DRILL, Natco #12 Multiple Spindle Motor Driven. #1 taper, 3 h.p. 220/440 motors. Arranged for 18 spindles. Rectangular bend. With Natco 24" Rotary Table.

PARTIAL LISTING OF LARGEST STOCK IN THIS AREA

BASE PITCH & SPACE MEASURING MACHINE #337 Illinois. Late Type—Like New. Capacity—12" diameter gear, 15" between centers. Full Set of Off-Set and Straight Contact Fingers. Dial Indicator. Tailstocks and Leatherette Cover.
SURFACE GRINDER, Horiz. #15 Covel 19½"x47½".
SURFACE GRINDER, Horiz. Leach 6"x12" Hand.
SURFACE GRINDER, Horiz. Thompson 18"x6" Hydraulic.
GRINDER, Cylindrical, Brown & Sharpe #2 Universal. 220/440 motors.
GRINDER, Tool & Cutter, Sterling #F Universal. 220/440 motors.
GRINDER, Surface, Covel #78 Horiz. Hydraulic 8"x24".
GRINDER, Cam, Landis 5"x40" "Type D" Hydraulic Semi-Automatic. New in 1942. Slight use, like new.
GRINDER, Cylindrical, Norton 10"x24" Hydraulic.
GRINDER, Cylindrical, B & Sharpe #4 Univ.
GRINDER, Cylindrical, B & Sharpe #16 6x18.
GRINDER, Cylindrical, Cinci. 6x18 Hydraulic.
THREAD GRINDER, J & Lamson #TG-615 Automatic. Late Type
GRINDER, Blanchard #16, 26" Chuck Vert Rotary.
GRINDER, Landis Crank 10x32 Hydraulic.
GRINDER, Brown & Sharpe #2 Auto. Horiz. Surface.
GRINDER, Cincinnati #EA, 10" x 36" Hydraulic Cylindrical, Filmatic Bearings, 220 volts motors Built-in electrics, Hydraulic infeed
GRINDER, Norton 6 x 18 Hydraulic Vert. Rotary Auto. Excello Spdle.
GRINDER, Norton 6 x 18 Hydraulic Horiz. Surface. Excello Spdl
GRINDER, Pratt Whitney 22" Vert. Rotary. 84" table travel.
GRINDER, Bath 10"x25" Motor Driven Universal Surface, 220/440 volts motor with centralized push button controls Internal Grinder Attachment & Steady Rest, etc.
GRINDER, Greenfield #12 Internal Hydromatic. 220/440 V.
GRINDER, Heald #70 Internal.
GRINDER, Pratt Whitney 14x36 Vert. Rotary
GEAR HOBBER, B & S #34 Spur. 18" dia.
GEAR SHAPER, Fellows #7 High Speed.
KEYSEATER, Mitts & Merrill #5 Giant Motor Driven, 220/440 volts motor, Capacity—24" long, 3" wide keyway. Automatic Feed.
LATHE, LeBlond 36"x30', 220/410 motor, 12 speed head, taper attachment, steady rests, etc.
LATHE, 32"x18' Bridgeford Q.C.G. Grd. Hd.
LATHE, American 27"x16' Grd. Hd. 12 Speed. Taper attach. & chuck.
LATHE, 26"x18' Bridgeford Q.C.G. Grd Hd.
LATHE, Bridgeford 26"x14' Q.C.G. 8'5" C.C. 220 volts two speed motor.
LATHE, 24"x8' Lodge Shipley, Hvy. Duty
LATHE, 24"x14' LeBlond Q.C.G. Grd. Hd.
LATHE, 20"x10' American Q.C.G. 72" c.c.
LATHE, 20"x10' Handey Q.C.G. Taper Att.
LATHE, Reed-Prentice 20"x60" Grd. Hd.
LATHE, 20"x8' Lodge & Shipley Q.C.G.
LATHE, 18"x8' Lodge Shipley Q.C.G. Gr. Hd.
LATHE, Monarch 18"x48" Model #CBB.
LATHE, 16"x6' LeBlond Q.C.G. Taper Attach.
LATHE, 16"x6' Lodge Shipley Q.C.G. Grd. Hd.
LATHE, 14"x8' Handey Q.C.G. Taper Attach.
LATHE, 14"x6' Handey Q.C.G. Taper Attach.
LATHE, 12"x5' Handey Q.C.G. Taper Attach.
LATHE, 10"x24" Logan #820 Q.C.G. NEW
LATHES, Turret, #1 Bardons & Oliver. ¾".
LATHES, Turret #2B Simmons Grd. Hd. 1¼".
LATHES, Turret, #2G Morey Grd. Hd. 1".
LATHES, Turret #4 W & S Univ. 1½".
LATHES, Turret, #2 Simmons Grd. Hd. 1".
TURRET LATHE—Gisholt #4 Univ. Grd. Hd.
MILLING MACHINE, Vert. #3 Cinci. High Power.
MILLING Machines, Vert. #4 Cinci. High Power.
MILLING Machine, Horiz. #2, #3, #4, #5 High Power. 220/440 Motors.
MILLING Machine, Horiz. #2SP Van Norman.
MILLING Machine, Horiz. #2M Cinci. Univer.
MILLING Machine, Horiz. #3 Kempsmith Univer.
MILLING Machine, Horiz. #4 LeBlond Univ. Hvy.
MILLING Machine, Horiz. #1½ B & Sharpe Univ.
MILLING Machine, Horiz. #2 Kempsmith Univ.
MILLING Machine, Horiz. #2 B & Sharpe Univ.
MILLING Machine, Horiz. #3 B & Sharpe Univ.
MILLING Machine, Duplex, Cochrane-Bly #14 Univ.
Mill & Shaper, #0 Taper. Shaper—0" to 6" Stroke. Rotary Table. 220-440 volts.
MILLING Machine, Duplex, Van Norman #2.
MILLING Machine, Cincin. #4—36 Plain Hydmatic.
MILING Machine, Cincin. #4—36 Dplx. Hydmtic.
MILLING Machine, Prod. #1—18 Cinci. Hor. Auto.
MILLING Machine, Prod. #0—8 Cinci. Vertical.
MILLING Machine, Prod. #0—8 Cinci Auto. Horiz.
MILLING Machine, Production, #12 B&S 18" Late Type (6).
MILLING Machine, Prod. #12 B&S 24" Late Type.
MILLING Machine, Horiz. K&T #2B Dble. Overarm. 220/440.
MILLING Machine, Horiz. K&T #3B Dble. Overarm. 220/440.
MILLING Machine, Horiz. Atlas Bench Mill, Like new.
MILLING Machine, Horiz. Nichols Hand Millers, late type.
MILLING MACHINE, Cincinnati Vertical #3 H.S. Dial Type, W/Rotary Table.
MILLING MACHINE, U. S. #MMI-8 Cam Controlled Automatic Horizontal, #40 taper, Late Type, 220/440 motors. TWO.
THREAD MILLER, Pian-O-Mill #3 Planetary Form & Thread Semi-Automatic Milling Machine, #40 Spdl. Timken Bearing. THY-MO-TROL Control Unit. 5 h.p.
PIPE THREADER, Williams #3, 1½" to 6".
BOLT THREADER, Hill-Acme #1½-C Sgle. Hd.
TAPPER & THREADER, W & S #11R Dual Radial. Motor and Tooling.
TAPPER, W & S #1 Sgle. Spdle.
O.B.I. Press, Bliss #21B, 40 tons. 2½" Stroke.
POWER PRESS, Bliss #164 Open Back S.S.S.A. 65 tons, 4" Stroke.
POWER PRESS, Bliss #84 S.S.S.A. 56 tons, 10" Stroke, 20" between uprights.
POWER PRESS, Bliss #75½ S.S.S.A. 120 tons, 5½" Stroke, 24" between uprights.
POWER PRESS, Bliss #3A S.S. Dble. Crank S.A. Grd. 45 tons, 4" stroke, 36" between uprights.
WHEEL PRESS, Niles B & Pond 200 Tons Hydraulic Horizontal, 48" between strain bars, Two Plunger Type, 7.5 h.p. 220/440 motor.
POWER PRESS — Bliss - Consolidated #163 - B Straight Side Dble. Crank Single Action, 45 tons, 6" stroke, Bed area—24" x 41", 15 h.p. 220 motor.
PRESS, Thomas #7A O.B.I. 80 tons, 4" Stro.
PRESS, Federal #2 O.B.I. Grd. 2" Stro.
PRESS, Federal #2 O.B.I. 2" Stro.
PRESS, Federal #3 O.B.I. Grd. 4" Stro.
PRESS, Federal #4 O.B.I. Grd. 3" Stro.
GEAR SHAPER, Fellows #72 High Speed.
SHAPER, Vert., Pratt Whitney #B—6" Motor Dr.
SHAPER—Columbia 32" B.G. Crank.
SHAPER—American 24" B.G. Crank.
SHEAR, Gap Squaring Niagara #3126B, 10'x⅜" Overdriven, 18" Gap, 20 h.p. motor, 220 V. spring hold-down and extra blades.
SHEAR, Squaring, Wysong & Miles #572-A, 6'x 14 ga. All Gauges & 220/440 motor.
SHEAR, Morgan 120"x¾" Guillotine Plate, 36" Gap.
SHEAR, Quickwork #A-1 Rotary 60" Throat. 18 ga.
WELDER, Federal #712 AT Motor Driven Toggle Action Projection. New in 1936. 200 KVA, 10" throat. Stroke—1" to 3". With controls.
WELDER, Federal #624B Hvy. Duty Grd. Type 75 KVA. 1½" Stroke. 17" throat. Motor driven.

AVAILABLE for PROMPT SHIPMENT

Here are a few of the more than 2000 Machines Currently in Stock



100" NILES VERTICAL BORING MILL

NILES 100" EXTRA HEAVY BORING AND TURNING MILL WITH WESTINGHOUSE 40 H.P. 230 VOLT D.C. MOTOR. MACHINE HAS TWO HEADS ON RAIL AND POWER RAPID TRAVERSE.

BORING MILLS

3½" bar Cincinnati-Gilbert Floor Type Horizontal, m.d., late type
No. 45 Giddings & Lewis Horizontal, m.d., 4½" bar
10" bar Sellers Floor Type Horizontal, m.d.
42" Bullard Spiral Drive Vertical, m.d., with side head
42" Colburn Vertical, m.d., 1 swivel head, 1 turret head, p.r.t.
54" Bullard Spiral Drive Vertical, m.d., with side head
62" Niles Heavy Duty Vertical, belted m.d., 2 swivel heads, p.r.t.
100" Niles Heavy Vertical, m.d., p.r.t.

HORIZONTAL DRILLS

No. ½Bx30" Pratt & Whitney 2 spindle Deep Hole Reaming Machine, m.d.
No. ½Bx50" Pratt & Whitney Gun Barrel Rifling Machine, m.d., latest
No. 1Bx74" Pratt & Whitney 2 spindle Deep Hole Reaming Machine, m.d., latest
No. 1½x105" Pratt & Whitney 2 spindle Deep Hole Drill, m.d., latest
No. 1½x105" Pratt & Whitney 2 spindle Gun Barrel Rifling Machine, m.d.
2 spindle No. 410 W.F. & John Barnes Deep Hole Drill, m.d.

GEAR MACHINERY

No. 61A Fellows Gear Shaper, m.d., latest type
No. 64A Fellows Gear Shaper, m.d., latest type
No. 645 Fellows Gear Shaper, m.d., latest type
No. 72 Fellows Gear Shaper, m.d., latest
Type A Barber-Colman Gear Hobber, m.d.
Type S Barber-Colman Gear Hobber, m.d.
No. 12H Gould & Eberhardt Gear Hobber, m.d.
No. 4-48" Brown & Sharpe Automatic Spur Gear Cutter, m.d.

TOOL & CUTTER GRINDERS

No. 10 Brown & Sharpe, m.d., latest
No. 4T Sellers Tool, m.d., latest
No. 6T Sellers Tool, m.d., latest
Barber-Colman Model HRS Combination Cutter Sharpener, m.d., late

MANUFACTURING LATHES

No. 4 LeBlond Boring Lathe, 37' bed, 13" hole 8x132" LoSwing, m.d., latest
13"x24' LeBlond Rapid Production, Timken, latest
13x36" LeBlond Rapid Production, Timken, latest

ENGINE LATHES

14x30" Lodge & Shipley Selec. Head, m.d., latest
14x24" centers Loage & Shipley, m.d., latest
14 'x6' Hendey Geared Head, m.d., taper
16"x30" Reed-Prentice, m.d., latest
18"x48" centers Lodge & Shipley, m.d., taper
18"x52" centers American Geared Head, m.d., taper
18"x7' Hendey Geared Head, m.d., taper
20"x48" centers LeBlond Geared Head, m.d., latest
22"x14' bed American H.D., m.d., taper, late type
32"x12' Lehmann Hydratrol Geared Head, m.d., taper, latest
38"x38' American Triple Geared Internal Face Plate Drive, m.d., taper
36"x36'6" Niles Heavy Duty, m.d., latest, 2 carriages

MILLING MACHINES

No. 0 Sundstrand Rigidmill, m.d., latest
No. 08 Cincinnati Mfg. Model EA, m.d., latest
No. 1-12 Cincinnati Plain, m.d., latest
No. 2-24 Cincinnati Plain, m.d., latest
No. 4-48 Cincinnati Plain Hydromatic, m.d., latest
No. 4-48 Cincinnati Duplex Hydromatic, m.d., latest
M30 Milwaukee Simplex, m.d., latest
No. 34-36 Cincinnati Duplex Hydromatic, m.d., with tracer control, latest
No. 34-36 Cincinnati Plain Hydromatic, m.d., with tracer control, latest
No. 54-60 Cincinnati Plain Hydromatic, m.d., latest
No. 36-72 Cincinnati Duplex Hydromatic, m.d., latest
No. 36-90 Cincinnati Duplex Hydromatic, m.d., latest
No. CT-36 Lees-Bradner Thread Miller, m.d., latest
No. CT-54 Lees-Bradner Thread Miller, m.d., latest
10x24" Hanson-Whitney Thread Miller, m.d., latest
No. 000 Brown & Sharpe Plain, m.d., latest
No. 2B Brown & Sharpe Plain, m.d., latest
No. 2 Cincinnati H.S. Dial, Plain, m.d., latest
No. 3 Cincinnati H.P. Plain, m.d., p.r.t., late type
No. 3B Brown & Sharpe Plain, m.d., late
No. 4K Milwaukee Plain, m.d., late type
No. 08 Cincinnati Vertical, m.d., latest
No. 2, 3 Cincinnati High Speed Dial Type Vertical, m.d., latest
No. 2, 3 Cincinnati Medium Speed Dial Vertical, m.d., latest
No. 4H Milwaukee Vertical, m.d., latest
No. 2HL Milwaukee Swiveling Head Vertical, m.d., latest
No. 2K, 3K Milwaukee Dial Vertical, m.d., latest
No. 3V Van Norman, m.d., latest

TURRET LATHES AND SCREW MACHINES

No. 1H6 Libby, m.d., chucking, latest
No. 1F Foster Fastermatic, m.d., Timken
No. 1L Gisholt Universal, m.d., chucking, Timken
No. 2A, 3A Warner & Swasey Universal, chucking, Timken
No. 2F Foster Fastermatic, m.d., Timken
No. 2G Morey, bar, m.d., latest
No. 2L Gisholt, m.d., chucking, standard and long bed types, Timken
No. 3F Foster Fastermatic, m.d., Timken
No. 3L Gisholt, m.d., chucking, Timken
No. 3L Gisholt, with cross sliding turret
No. 4FU Foster Fastermatic, m.d., latest
No. 5 Bardons & Oliver Universal Ram Type, m.d., chucking, preselector head, latest
No. 5 Gisholt Ram Type Universal, m.d., Timken, late
No. 7 Bardons & Oliver Universal, m.d., chucking, late

TAPPERS

No. 1 Bakewell Precision, m.d.
No. 1R Bakewell Precision Radial Topper, m.d., latest
Baush Radial Drilling & Tapping Machine, m.d., latest

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THE EASTERN MACHINERY COMPANY
1004 Tennessee Avenue, Cincinnati 29, Ohio
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CABLE ADDRESS EMCO

MAKE YOUR TACKLE ON THIS LIST

—to find your machine tool needs that will help you organize the machine production power for that yard by yard gain that leads right up to the goal post.

FOR THE BEST IN MACHINE TOOLS CALL NOLL FIRST

AUTOMATICS

1⅝" National Acme Model GAR 4-Spindle
2" Cleveland Model B, Single Spindle
3¼" National Acme Model "L" Single Spindle
1⅝" Conomatic 8-Spindle

BORING MILLS, HORIZONTAL & VERTICAL

3" Bar No. 31 Lucas Horizontal, Platen Area 22x42", #5 M.T.
3½" Bar Portage Horizontal
4½" Bar Bement Table Type, Horizontal, Table 33x66", 48" Travel
4½" Bar Giddings & Lewis No. 45 Horizontal Table Type, Table, 40x84"
4½" Bar Ohio No. 5F Horizontal, #6 M.T.
6" Bar Betts Horizontal Floor Type
24" Bullard Vertical
36" Bullard Vertical
36" Rogers Vertical
44" Cincinnati Vertical
44" Niles, 20" Bar Travel, Fast Traverse
68" Colburn Vertical
100" Niles Vertical, 39" Bar Travel, Power Rapid Traverse

DRILLS & RADIAL DRILLS

1-Spindle Minster "JR" #12—24", #5 M.T.
4-Spindle No. 2 Leland-Gifford Model 2MS
3'9" Column Cincinnati-Bickford
4'9" Column Cincinnati-Bickford
6'19" Column American
9' Arm Ridgeway, #5 M.T.

GEAR EQUIPMENT

No. 3 Gleason Spiral Bevel Gear Generator
No. 3-26 Brown & Sharpe Gear Cutter
No. 4—48 Brown & Sharpe Gear Cutter
No. 6-60 Brown & Sharpe Gear Cutter

GRINDERS

Wickman Profile Grinder, Cap. 5¾"x2⅜"x2", Range 6¾"± unlimited length
Blanchard #18 Rotary Surface Grinder
Heald #22—12" Rotary Surface Grinders
Abrasive #33 Surface Grinder with Universal Table
Ex-Cell-O #31 Plain Thread Grinder
Hammond, Size WR-2 High Speed Grinder
Hammond Size WP Floor Model Wet-N-Dri 6" Abrasive Belt Grinder
Bryant #5 Plain Chucking Grinder
Heald #48A Borematic Grinder
Heald #72A Internal
Heald #81 Gagematic—Sizematic
Landis 10"x18" Type "C"
(3) Fitchburg 10"x18" Angular Head
Brown & Sharpe #4 Universal
Brown & Sharpe #22—10"x36" Cylindrical Plain
Norton 10"x36" Model "C" 45 Cylindrical Angular
Van Norman 20"x48" B.C. Crankshaft Re-Grinder
Lobdell #3GH Roll Grinder, grinding capacity 30" dia. x 160" face length of bed, 19'6"
Cincinnati #2 Centerless
Besly No. 342 Grinder
Besly No. 205 Double End Grinder
Gardner No. 218 Double End Grinder
K.O. Lee Tool & Cutter Grinder
Diamond #1 Surface Grinder, 12x27" Magnetic Chuck
Pratt & Whitney #12B Profile Grinder
Lodge & Shipley 18"x10' Engine Lathe

SAWS

Cochrane-Bly #55 Cold Saw
Campbell #401 Wet Abrasive Cutomatic Saw
Rasmussen 6"x6" Hack Saw

PLANERS

Pond 96"x72"x18' D.H. Planer, Table 64"x18'
Chandler 30"x30"x8'6" Planer, Table 12'x27"
Hamilton 48"x48"x12' D.H. Planer, Table 12'x40"
Cincinnati 48"x36"x18' Planer

LATHES

Lodge & Shipley #3A Duomatic
Lodge & Shipley #3 Duomatic
Porter-Cable Carbo Lathe
Monarch 20"x48" Engine Lathe
Lodge & Shipley 20"x112"
LeBlond 21"x7' G.H. Engine Lathe, with T.A.
American 24"x7' G.H. Engine Lathe
Boye & Emmes 24"x6'
Boye & Emmes 36"x16'
Betts-Bridgeford 36"x8' B.C.
Seneca Falls 5x30" LoSwing Lathe Model "U"
Israel Johnson 48"x18'6" Lathe

TURRET LATHES

Morey #2G, Bar Feed, 1" Capacity
Warner & Swasey #1
Warner & Swasey #3
Gisholt #4L, 9" Hole in spindle
Denver 6.2 Turret Lathe
Foster #7 Geared Head, Bar Feed
Libby Turret Lathe
Foster #2FU Fastermatics

MILLS

Brown & Sharpe #000 Milling Machine
Brown & Sharpe #3 Horizontal
Cincinnati #2 Vertical
Brown & Sharpe #3 Universal
Brown & Sharpe #3A Universal Horizontal
Producto Model "M" Hand Mill, Table 6x26"
Kent-Owens #1-14, 6" Vertical Travel
Cincinnati #3-24 Hydromatic Mill
Hardinge Horizontal & Vertical Mills
Lees-Bradner 12"x36" Thread Mill Model "HT"
Cleveland #1 Vertical
Cincinnati #1-18
Cincinnati #4 Vertical High Power

SHAPERS

Fellows #61 Gear Shaper
Pratt and Whitney 6" Vertical Shaper
Betts 18" Slotter
Gould & Eberhardt 20" Shaper & 32"
Niles 16" Horizontal Shaper
Morton 30" Draw Cut Shaper

PRESSES

V & O #3—¼ O.B.I. Press, 30 ton, 2" Stroke
Toledo #59—⅜ S.S.S. Single Crank 545 Ton, Bed Area 42"x42" shut Height 24", stroke of Slide 5".
Toledo #82C Double Crank Single Back Geared Blanking Press, 90 Ton, Circular Bed Area 44" in diam., Stroke of slide 2"
Toledo #95-B Double Crank Double Back Geared Press 243 Ton, Bed Area 54" Diameter, Stroke of Slide, 3"
HPM 100 Ton Hydraulic Press, Pressing Area 18"x18", 12¼" Stroke
Minster #100-4-60, 32"x60" Bolster Plate Area, Twin Screw Press, 100 Ton
Bliss #303—½, 35 Ton S.S. Single Crank Punch Press
Niagara #5 O.B.I. Press, Bed 25½x14½", Stroke 2½"
Toledo #52 S.S. Press, Bed 27½"x28", Stroke 3"
Toledo #54 S.S. 58 Ton Press, Bed 13"x15", Stroke 2½"

MISCELLANEOUS

Ajax 3" and 1" Upsetter
Detroit Tap Grinder
Elwell-Parker Boom Crane
Foster 4"x18" Superfinisher
Manville 150-Ton Header, ½x8" Capacity
Cincinnati #3—48 Hydro Single Ram Vertical Broach
Zagar Vertical Hydraulic Broaching Machine
50 KW 3-Station Tocco Unit
Chicago Pneumatic Stationary Riveting Machine
Long & Allstatter Double End Punch & Shear
Micromatic Hone
Warner & Swasey #11 Tapper
Key Seater
Surface Combustion Annealing Furnace, Back Pusher Type

WRITE, WIRE OR PHONE EXPRESS 1-0700 TODAY

Noll EQUIPMENT CO.
4537 ST. CLAIR AVE.
CLEVELAND 3, OHIO
MDNA MEMBER

LATEST TYPES
GUARANTEED MACHINE TOOLS
1941 - 1950 MODELS

MEET PRODUCTION DEMANDS WITH "TRIPLEX TOOLS"

MILLING MACHINES
CINCINNATI: 2-spindle Vertical Hydrotel with two rotary tables.
CINCINNATI: No. 2M Vertical, Rotary table with power feed.
CINCINNATI: 0-8 Vertical.
REED-PRENTICE: #5 Vertical.
SUNDSTRAND: 96 Rigidmil-Duplex (for milling cam tracks in propeller hubs or similar).
SUNDSTRAND: Nos. 0 and 00 Rigidmil.
MOREY: 12M 2-spindle Profiler.
TAYLOR-FENN: M-80 Duplex Spline.
TAYLOR-FENN: Vertical. 6"x21" table.
RICE-BARTON: Duplex Spline.
VAN NORMAN: Contour Miller 10CT.

THREAD MILLERS & TAPPERS
HALL PLANETARY: B, C & D Thread.
LEES-BRADNER: LT 6"x36" Thread.
LEES-BRADNER: 40A Thread Miller.
MOREY: 12"x60" Thread Miller.
MURCHEY: No. 22 Tapper, Horiz.
NATCO: Vert. Tapper 16 spindle.
PRODUCTO: Hand Tapper.

TOOL SHARPENERS
OLIVER: 2A Face Mill Grinder.
RANSOM: 2-wheel Grinder, 3 HP.
OLIVER: 510 Drill Sharpener.
OLIVER: 10" Tool Bit-Template.
FELLOWS: Flat Top Helical Gear Cutter.

GRINDERS—THREAD
EXCELLO: No. 31 and No. 33 Ext.
JONES & LAMSON: TG-848 Ext.
JONES & LAMSON: TG-1245 Ext.

GRINDERS—CYLINDRICAL
BROWN & SHARPE: No. 10 and No. 23 Plain.
CINCINNATI: No. 2 Centerless.
CINCINNATI: 6"x18" Hydraulic.
CINCINNATI: 10"x36" Hydraulic.
LANDIS: 16"x16" "C" Plain Hydr.
LANDIS 16"x32" Type "D" Crankpin, Hydraulic.
NORTON: 6"x18" & 10"x18".
NORTON: 10"x18" 45° angle wheel head.

GRINDERS—RADIUS
VAN NORMAN: No. 73, 639, 649.
VAN NORMAN: No. 3½ Universal.

GRINDERS—INTERNAL
BRYANT: No. 5Y Internal.
BRYANT: 112 Universal, Hydraulic.
BRYANT: 16C16 Hole.
HEALD: No. 55 Planetary.
HEALD: 70A Plain.
HEALD: 72A3, 72A5 Plain and Univ.
HEALD: 72A3 Sizematic Centerless.
HEALD: 72A5 Sizematic
HEALD: 72A5 T-bed, Universal
HEALD: 172 Sizematic for cyl. cams.
RIVETT: No. 104 Tool Room.

GRINDERS—SURFACE
ARTER: A-1—8" Rotary.
ARTER: A-3—12" Rotary.
THOMPSON 8"x12"x18" Type B.
HEALD: 8" Rotary.
HEALD: No. 22 Rotary—12" Chuck.
GARDNER: 120A Opposed Head Disc.

HONING MACHINES
BARNES: No. 306H Vertical.
MICROMATIC: H-510 D.E. Horiz.
MICROMATIC: H-2 S.E. Horiz.

LAPPING MACHINES
NORTON: No. 26 Hyprolaps.
NORTON: No. 2Fx40" Diameter.
SCHRANER: Model A External Cylindrical Lapper—6 heads.

GEAR & SPLINE GRINDERS
PRATT & WHITNEY: 10" single and double wheel.
GEAR GRIND MACH.: GG-19, 10"x24" Hydr. Spur Gears and Splines, also Internal.
GLEASON: No. 17 Spiral, Zerol and Hypoid.
MAAG: SS30 11¾" diameter.

GEAR CUTTING MACHINES
BARBER-COLMAN: No. 3 Hobber.
BROWN & SHARPE: No. 6 Gear Cutter 72" diameter.
CLEVELAND: No. 140 Hobber—1 spindle.
FELLOWS: 61, 61A, 64A, 6Z2, 7 and 72 Shapers.
FELLOWS: Straight Line Generator.
GLEASON: #12 Rough & Finish Generator.
GLEASON: 3" Straight Bevel Gear.
GOULD & EBERHARDT: 12H Hobber.
GOULD & EBERHARDT: 36BM Cutter.
HAMILTON: No. 1 Hobber, 6" dia.
SYKES: Gear Machinery (all sizes).

GEAR FINISHERS & TESTERS
FELLOWS: 8LSI and 13LSI Gear Lappers. External and Internal. Spur and Helical.
FELLOWS: No. 8M Red Liner.
FELLOWS: No. 12-C Spacing Tester.
GLEASON: No. 13 Universal Tester.
GLEASON: No. 4 and No. 6 Bevel Gear Testers, Hand and Power Operated.
GLEASON: 3" Bevel Gear Tester.
ILLINOIS: No. 224 Involute Checker and Recorder.
ILLINOIS: 514 Center distance & Concentricity Checker.
ILLINOIS: 604 Bevel Gear Hand Rolling Fixture.

PRECISION BORING
BARNES: No. 412 Horiz. 60" travel.
HEALD: 48A S.E. 2-spindle.
HEALD: 48B Double End.
HEALD: 47A Single End Single Spindle.

LATHES—PRODUCTION
LEBLOND: 25"x48" Engine, raised to swing 40".
LIPE-ROLLWAY: 15"x30" Cam-omatic.
LODGE & SHIPLEY: No. 3A Ducmat c.
POTTER & JOHNSTON No. 4D Automatic.
SUNDSTRAND: 8x15 Automatic Lathes.

LATHES—TURRET
BULLARD: 24", 36" Vert. Spiral Drive.
WEBSTER & BENNETT: Vertical Turret Lathes 36", 48" & 60" dia.
GISHOLT: #2L Saddle Type, Extended bed.
HERBERT: Turret Lathes (all sizes).

DRILLING MACHINES
AVEY: No. 2 Deep Hole Drill, 16" stroke—hydraulic.
LELAND-GIFFORD: No. 2LMS Deep Hole.
BARNES: 2011¼ 2 spindle on 4-spindle base.
BAKER: 30HO 2 spindle inverted.
BAKER: 217 Upright Heavy Duty.
FOSDICK: No. 4BM Upright H.S.
PROVIDENCE ENG. FV-6 Sensitive 6-spindle, ¾" capacity.
PRATT WHIT.: ½Bx50 Deep Hole Reamer.
ARCHDALE: Radial, all sizes (New).
WALKER-TURNER: D1100F 1" cap. floor type.
WALKER-TURNER: D950, ½" cap. bench type.

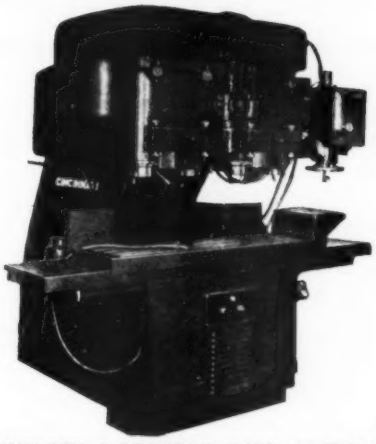
MISCELLANEOUS
CINCINNATI: 2-36 Broach.
BLOUNT: Polishing Lathes 12x48.
GARDNER: No. 6 Disc Grinder.
ALLEN: No. 2 Stud Setter.
CAMPBELL: No. 425 Cutalator.
WILLIAMS: 10" Pipe Cut-Off.
TANNEWITZ: GH-36 Band Saw.
KENT: 3¼" Bar Pointer & chamfer.
MATTHEWS: 9A Marking.
GENERAL: No. 33 Flexible Press.
DENISON: 918-AM Hydr. Test Stand.
LINK: PB4-250 Spring Tester.
GEN. ENG.: Riveter 24" Throat.
OSBORN: 405 Jolt Rollover.
OSBORN: 602 Jolt Rollover
WALKER-TURNER: Bench Grinder GR-50E ½ HP
MOTCH & MERRYWEATHER: #3 Saw Auto. Stock Feed 28" blade.

TRIPLEX MACHINE TOOL CORPORATION

75A WEST STREET **HAnover 2-4520** **NEW YORK 6, N. Y.**

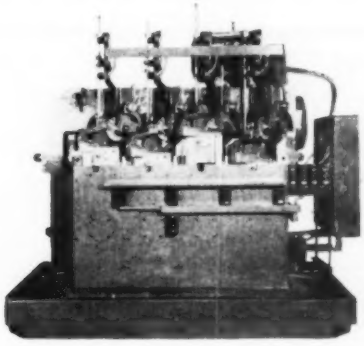
EMERMAN OFFERS FROM STOCK

FOR SALE or RENT



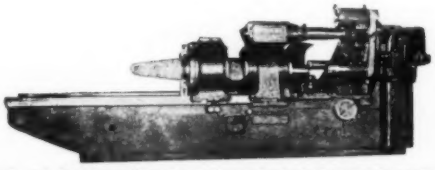
CINCINNATI 4-SPINDLE 360° AUTOMATIC PROFILING MACHINE

Table working surface 14"x47¾"
Longitudinal travel of table 12"
Transverse travel of cross-slide 15"
Vertical travel of head 6"
Spindle center distance, center to center 12"
No. 40 National Standard Taper
Diameter of spindle nose 3½"
Diameter of hole through spindle ¾"
Speeds 20, 125 to 3800 RPM
Feeds—Infinite range 1" to 50" per min.
Complete with motors, pumps, piping and all electrical controls. Weight approx. 10,300 lbs.



Davis & Thompson 4 Spindle Rise & Fall Milling Machine built for high production milling of small pieces. Clamping is accomplished by hand. One operator is required for the machine. The table action is such that the operator can go from one table to the next removing pieces and putting in rough castings while the other three tables are working. This machine can also be arranged with power clamping. Productions vary according to the character of the work.

JUST RECEIVED!!! 12"x102 Lees Bradner, model HT, 6" hole through spindle. 3-jaw universal chuck at each end of spindle. Latest

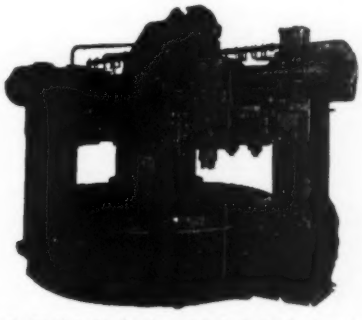


NO. 16 AM-28" BRYANT HYDRAULIC HOLE GRINDER

"For grinding propeller blades for aircraft motor or internal grinding on similar parts. Maximum grinding travel 14". With Universal latch to position facing wheel in proper location for grinding various diameters."

9' additional bed with extra work holding head. *Complete with electrical equipment.*

NEWTON TYPE V-4 CONTINUOUS ROTARY MILLING MACHINE



Equipped with 2 double heads, and 2 single heads, diameter spindle sleeves 6⅜" complete with 25 H.P. motor.

An ideal machine for continuous production of cylinder blocks, bases and a multitude of similar parts.

EMERMAN MACHINERY CORP.

870 W. 120th STREET — **CHICAGO 43, ILLINOIS**

UNUSUAL BUYS WITH GUARANTEED PERFORMANCE

BOLT CUTTERS
Acme 1" "Class A", 3 SCD
Acme 3½" "Class A", 4 SCD

BORING MILLS—VERTICAL
Bullard 24", jaws built in chuck table
King 34", with turret head, 12 speed
Bullard 42", Two heads on cross rail

BORING MILLS—HORIZONTAL
Cleveland No. 1 Horizontal, 2½" bar
Barnes No. 3, 3" bar
P & H Floor Type, 4" bar
Heald No. 44 Borematic, three heads

GEAR CUTTERS & HOBBERS
Adams No. 3 Gear Hobber
Barber Co'umn No. 12 Gear Hobber
Flather 30" Automatic Gear Cutter
Gould & Eberhardt No. 18-H Gear Hobber
Brown & Sharpe No. 3-36 Gear Cutter
Brown & Sharpe No. 3-26 Gear Cutter
Gleason 3" Bevel Gear Generator
Gleason 6" Straight Bevel Gear Generator
Gleason 54" Bevel Gear Planer

RADIAL DRILLS
American 5'14" Triple Purpose Plain
American 7'16", Triple Purpose
Cincinnati Bickford 7'15", Plain

TOOL & CUTTER GRINDERS
Oliver No. 5 Drill Grinder
Gisholt Shear Blade Grinder
Sellers No. 4T
Sellers No. 6T
Oliver No. 2 Drill Grinder

EXTERNAL GRINDERS
Landis 14x36 Universal, Type C Hydraulic
Landis 26x144 External
Landis Chaser Grinder, Model "Y"
Landis 16"x72" Plain Cylindrical
Brown & Sharpe No. 12, Plain
Pratt & Whitney Plain
Landis No. 2 Universal
Landis 10"x24" Type "C" Hydraulic Universal
Norton 10x24 Plain, Type "BA"
Cincinnati 12x48

INTERNAL GRINDERS
Heald No. 70A, NEW 1941
ExCello No. 31 L Precision Thread Grinder
Rivett No. 134-2, NEW 1942

SURFACE GRINDERS
Covel No. 72 Hand Feed Surface

KEYSEATERS
Baker No. 1
Baker No. 2
Mitts & Merrill No. 2
Mitts & Merrill No. 4

LATHES
American 16"x6', High Duty
American 16"x8', 3 SCD, Bowl head
American 18"x6', Geared Head
American 18"x8', Geared Head
American 18"x8', 3 SCD, Bowl Head, Back geared
American 18"x8' Geared Head, 8 Speed
American 24"x8', Geared Head, 8 speed
American 24"x10, Geared Head
American 24"x14' Geared Head, 8 speed
American 30"x12', Geared Head, 12 speed
American 30"x13', Geared Head, 12 speed

American 36" x 40' Geared Head Inter Face Plate Drive

Axelson 18 x 10 Geared Head, taper
Hendy 14"x6', 3 SCD
Hendy 16"x6', 4 SCD, SBG, Yoke Head
Hendy 18"x8', 4 SCD
LeBlond No. 6 Multi Cut
LeBlond 14"x6', 4 SCD, SBG
LeBlond 17"x8', SCD, DBG
LeBlond 21"x8', 3 SCD, DBG
LeBlond 24"x10', 3 SCD
LeBlond 25"x12', Heavy Duty, FIRST CLASS
LeBlond 27"x96" centers, NEW 1941
Lodge & Shipley 14"x6', 5 SCD, BG
Lodge & Shipley 14"x6', 3 SCD, DBG
Lodge & Shipley 16"x30" centers, NEW 1942
Lodge & Shipley 16"x8', Selective Grd. Hd.
Lodge & Shipley 18"x6', Selective Grd. Hd.
Lodge & Shipley 18"x8', 5 SCD, SBG
Lodge & Shipley 18"x8', 3 SCD, DBG
Lodge & Shipley 18"x8', Selective Geared Head
Lodge & Shipley 16"x9', Bowl head type, 3 SCD
Lodge & Shipley 18"x10', Patent Head
Lodge & Shipley 20"x8', Geared Head
Lodge & Shipley 27"x18', Patent Head
Monarch 12 x 54 Model "CK" Screw Cutting Engine Lathe, with taper, 1942
Niles 30"x10" centers Timesaver
Sebastian 12"x4', Geared Head
Hamilton 14"x6', 4 SCD, BG
Monarch 14"x6', 3 SCD, DBG
Mulliner 14"x6', 4 SCD, BG
Rockford 14"x6', 3 SCD, DBG
Davis 16"x6', cone head with Cullman Drive
Carroll Jamieson 16"x8', 4 SCD, SBG
Monarch 16"x6', 8 speed
Monarch 16"x8', 3 SCD, DBG
Sebastian 18"x8', 4 SCD
Boye & Emmes 18"x6', 3 SCD, DBG

BLOUNT MODEL B-3 SPECIAL APPLICATION LATHE FOR TURNING, CHUCKING, POLISHING & LAPPING —NEW IN 1941

Reed 18"x6', 3 SCD, BG
Boye & Emmes 18"x8', 3 SCD, DWA
Springfield 18"x8', 4 SCD
Sidney 19"x8', 3 SCD, Bowl Head
Boye & Emmes 20"x8', 3 SCD, DBG
Walcott 26"x10', 3 SCD, DBG
Schumacher & Boye 36"x24', Internal Face Plate Drive

TURRET LATHES
Warney & Swasey No. 2A, Universal
Warner & Swasey No. 4, Universal
J & L 2¼"x24" Hartness Flat
Acme 2½"x26" Flat, 12 speed
J & L 3½"x32" Flat
Jones & Lamson 3"x36"
Gisholt 21", 2 SCD
Foster No. 7, Geared Head
Libby 18", Power Feed Cross Sliding Turret, Heavy Duty
Cincinnati Acme No. 2, Universal
Foster No. 1 B, Universal
Mullholland No. 4, 3 SCD, BG

MFG. MILLERS
Ohio 40" Tilted Rotary
Cincinnati 12" MFG.
Kent Owens No. 1-B, Hydraulic
Van Norman No. 118, Bed Type Production

PLAIN MILLERS
Cincinnati No. 3 Dial Type Plain
Milwaukee No. 1-B, Double Round Overarm
Kempsmith No. 1, 4 SCD, SBG
Milwaukee No. 1½B, SPD, Round double overarm
Brown & Sharpe No. 2B, Double overarm
Kempsmith No. 2, 4 SCD, SBG, SRO
Brown & Sharpe No. 21, Double overarm
Rockford No. 2, High Powered, Back Geared
Milwaukee No. 3 B, Single overarm
Brown & Sharpe No. 3 B, Heavy, Single overarm
Cincinnati No. 3, Plain, 3 SCD, DBG
Milwaukee No. 3B Double Overarm
Cincinnati No. 3, Single pulley drive
Cincinnati No. 4, 3 SCD, DBG
Brown & Sharpe No. 5B Heavy, Single Pulley Drive, SRO

UNIVERSAL MILLERS
Cincinnati No. 3S Universal, SPD
Cincinnati No. 1, Univ. 4 SCD, SBG
Milwaukee No. 2 B Univ. SPD, DRO
Cincinnati No. 3, Univ. High Power
Brown & Sharpe No. 3A, SPD
Cincinnati No. 4, SPD, RO
Brown & Sharpe No. 4A, all geared feeds

VERTICAL MILLERS
Cincinnati No. 3, 16 speed
Brown & Sharpe No. 2, all geared feeds
Cincinnati No. 4, SPD

MILLERS—MISCELLANEOUS
Lees Bradner No. 40 Automatic Thread Miller

PLANERS
Gray 30 x 30 x 10 Double Housing
Gray 36 x 36 x 12 Double Housing
Gray 42 x 42 x 12 Double Housing

SAWS
Peerless 10 x 10 Universal Shaping
Peerless 9x9

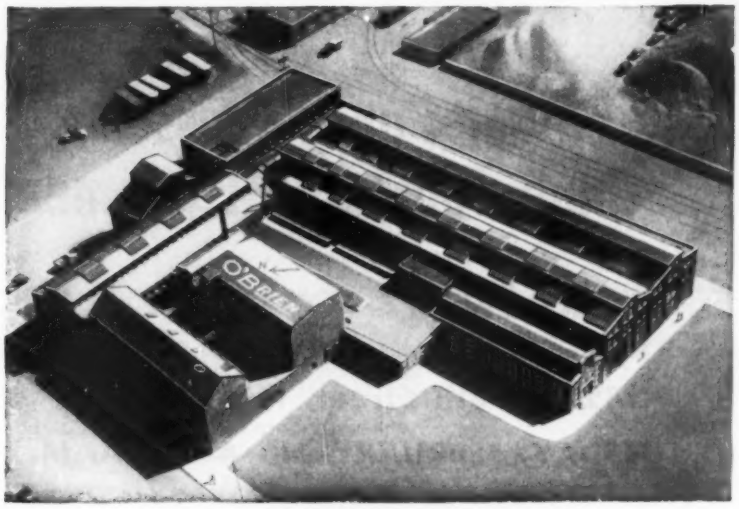
SHAPERS
Smith & Mills 15", Single pulley drive
Cincinnati 16", Back Geared
Gould & Eberhardt 16", Back Geared
Barker 18", Back Geared, 4 SCD
Gould & Eberhardt 20", Back Geared
Averbeck 21", Back Beared
Columbia 22", Back Geared
Gould & Eberhardt 24', High Duty, Back Geared
Gould & Eberhardt 24", Back Geared, Cone Drive
Potter & Johnson 24", Univ., 3 SCD
Universal 24", Openside Planer Shaper
Gould & Eberhardt 32", Back Geared

MISCELLANEOUS
Grant 4A Rotary Vibrating Riveter
Leland Gifford 14", Upright Drill press
Avey ½ Single Spindle Drill
Avey No. 2, 2 spindle Drill Press, NEW 1941
Hobart Arc Welders, 300 AMP
Besley No. 1 Double End Disc Grinder
Besley 18" Disc Grinder
100 lb. Little Giant Hammer
Pexto No. 1748 Foot Punch Press
Krummel Press, Horn Type, 30 ton
Whitney Jensen No. 28 Toggle Action Foot Press
Famco No. 8X Kick Press
Edgemont Screw Press, Power driven
Pexto No. 737 Foot Notching Machine, 20 gauge
Niagara No. 66 Deep throat Shear & Punch
Excelsior No. 10 Punch
Cincinnati Punch & Shear, 36" throat
Kane & Roach No. 2 Multiple Punch & Shear
Townsend No. 1 Riveting Machine
Niagara 42" Power Squaring Shear
Stanley No. 0-36 Unishear
Pratt & Whitney 6" Vertical Shaper, NEW 1941
Pratt & Whitney 10" Vertical Slotter
Garvin No. 2 Automatic Tapping Machine
Garvin No. 1 Knee Type Tapping Machine
Sciaky Welder type PMC02S-4, NEW 1943
Grob FA-30 Filing Machine
Westinghouse 200 AMP Arc Welder
Williams & White Bulldozer
Covel Hanchett No. 1130 Metal Saw Sharpener, NEW 1943
Savage No. 118 Nibbling Machine
Pratt & Whitney Bench Upright Shaving Machine, NEW 1941
Grant Rivet No. 80 Spinning Machine
Coulter High Speed Threading Lathe
Pratt & Whitney No. 12 Profiler

GUARANTEED MACHINERY

CINCINNATI MACHINERY CO., INC.
219 East Second Street **Cincinnati 2, Ohio**

Q U A L I T Y



I N T E G R I T Y

NEW OFFICE, SHOWROOM, SHOPS AND WAREHOUSE
1545 N. DELAWARE AVE., PHILADELPHIA, PA.

POWER PLANT EQUIPMENT

TURBO GENERATORS
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MOTOR GENERATORS
ELECTRIC MOTORS
DIESEL ENGINES
AIR COMPRESSORS
BOILERS, All Types
TRANSFORMERS
PUMPS, BLOWERS
REWINDING
COMPLETE POWER PLANTS

METAL WORKING MACHINERY

TOOLROOM, ENGINE LATHES
TURRET LATHES
BORING MILLS
PLANERS, SHAPERS
DRILL PRESSES
MILLING MACHINES
GRINDERS, All Types
PIPE & BOLT THREADERS
PRESSES, HAMMERS
BRAKES, SHEARS
PUNCHES, WELDERS

WANTED: Yes, we want good machine tools in any quantity. Call or write us today.

SINCE 1915

THE O'BRIEN MACHINERY CO.

T. M. REGISTERED U. S. PATENT OFFICE

Cable Address: OBRIEN PHILA

PHILADELPHIA'S LARGEST MACHINERY DEALERS AND EXPORTERS

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AFFILIATED WITH
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RIO DE JANEIRO—BRASIL

At Auction

Power Punch Presses Machine Tools and Equipment

of Planted Operated by

E. J. McALEER & COMPANY, INC.

Manufacturers of Houseware & Metal Specialties

1422 N. 8th Street, Philadelphia

TUESDAY, FEBRUARY 6th AT 10 A. M.

ON THE PREMISES

PRESSES: 5 Niagara, Cleveland, Henderson and Adriance 15 to 150 Ton Straight Side Double Crank Punch Presses. 14 Ferracute, Bliss, Niagara and Johnson 10 to 75 Ton Open Back Inclinable Punch Presses. 5 Bliss, Ferracute and Adriance 12 to 30 Ton Hornung Presses. 2 Bliss 75 Ton Toggle Drawing Presses; Bliss Stiles Type 50 Ton Press; 3 Portable Elevator Type Punch Press Die Tables; Ferracute, Bliss and Niagara Bolster Plates, Etc.

SHEARS: 9 Niagara, Bliss, Pexto and Toledo Power Gap and Squaring Shears, 32 in. to 6 ft., 12 to 18 ga. Niagara and other Circle Shears.

BRAKES: 11 Chicago, Verson and Niagara Power Presses; Cornice and Box and Pan Brakes, Bar Folders, Roll Forming Machines, Crimpers, Beaders, Etc.

SPOT WELDERS: 23 Acme, American, Taylor and Alphil Electric Spot Welders.

MACHINE TOOLS: American and Springfield Back Geared and Crank Shapers; B & S Universal Miller and Index Head; Davenport and Carroll & Jamison Engine Lathes; South Bend Bench Lathe; Cincinnati-Bickford, Leland Gifford and Excelsior Vertical Drill Presses; Walker-Turner Radial Drill Presses; 2 Craftsman 2-Spindle Drill Presses; Marvel Hack Saw; Jones Abrasive Grinder; Radial Abrasive Cut Off Machine; Delta Disc Sander; Harvey Filing Machine; Diamond Tool and Surface Grinder.

PAINT SPRAY EQUIPMENT: 2 Binks Spray Booths, 7 Binks and Eclipse Pressure Tanks. 4 Binks Pressure Regulators, Worthington and Gould Centrifugal Pumps, Exhaust Fans.

DIES: For manufacture of Frying Pans, Cabinets, Houseware & Metal Specialties.

MISCELLANEOUS: Richards-Wilcox 375 Ft. Link Roller Chain Conveyor, Detrex Solvent Machine, Lydon Industrial Drying Oven, Sheet Metal Infra Red Ray Drying Oven, Exhaust Blowers and Fans, Electric Motors, Office Furniture and Office Equipment, Etc.

Descriptive Illustrated Circular Upon Application to

SAMUEL T. FREEMAN & CO., Auctioneers

1808-10 CHESTNUT STREET, PHILADELPHIA 3, PA.

50 CHURCH STREET, NEW YORK 7, N. Y. **80 FEDERAL STREET, BOSTON 10, MASS.**

Miles MACHINERY,

YOUR BEST BET FOR INCREASED PRODUCTION PROFITS IN 1951

● Miles late type rebuilt tools are used by many of the finest concerns in this country to maintain or increase production schedules. If you need additional machinery it will be well worth your while to get a proposition from Miles.

A PARTIAL VIEW OF OUR HUGE STOCK

AUTOMATICS

⅝" and 1¼" Cone 4 spindle.
1 1/16" Cleveland "M" 4 spindle.
2" x 18" Cleveland Model "B" bar.
No. 454 New Britain chucking.
1½" x 10" Fay chucking.
14" x 18" Monarch Magnamatic lathe.
8" Bullard Multaumatic.
1" Economy automatic bolt head shaver.

BORING MACHINERY

36" No. 3A Universal horizontal.
3½" No. 32 Lucas horizontal.
4" Detrick & Harvey floor.
4½", No. 33 Lucas horizontal.
5" bar Jones planer table type.
100" Niles-Bement-Pond, heavy pattern.
84" Gisholt vertical.
52" King vertical.
38"-14" Niles B. P. turret, side head.
24" Bullard VTL. New Era.
Munson double end.
No. 42 Heald Borvmatic, 2 spindle.
Nos. 112B and 2112 Excello precision borers.
No. 218 Excello double end.

BROACHES

15 ton, 42" stroke, V3 Lapointe vert.
10-ton Colonial, 36" stroke, duplex surface.
15-ton American 36" stroke, duplex surface.
No. 1 Foote Burt duplex surface.
2-ton Amer. Mod. HO horizontal hydraulic.
No. 4 Oilgear horizontal hydraulic.

DRILLS, RADIAL

Walker-Turner, sensitive, with pedestal.
4' Cincinnati Bickford Universal.
4' Hammond types G and D jack knife.
6'-15" Dreses.

DRILLS, SENSITIVE

Most makes to 1 and 2 spindle.
12" No. 36 Avey, 1, 2 and 3 spindle.
14" Leland Gifford, 1, 2 and 4 spindle.
15" No. 2 Avey hydraulic jump feed.
16" Allen No. 2 Six spindle.
16" Henry & Wright, 1 and 2 spindle.
24" Demeo 4 spindle, No. 3 taper.
24" Ellund, No. 4B, Power Feed.

DRILLS, MULTIPLE AND MISCELLANEOUS

34 spindle, No. 30 Natco multiple.
22 spindle, No. 14 Natco multiple.
16 spindle, No. 13 Natco multiple.
12 spindle, No. 39 Natco rail multiple.
No. 15½ Foote Burt hydraulic vertical.
Munson heavy double end.
No. 4HH Baker horiz. 2-way hydr. 25 H.P.
Barnes 2 spindle deep hole or rifle drill.
5 spindle Detroit horizontal.
Natco 1-way horiz. hydr. unit head.

DRILLS, UPRIGHT & HEAVY DUTY

20" Sigley.
20" No. B225H Natco hydr., 1" capacity.
20" Barnes heavy duty 1½" capacity.
20" No. 2 Colburn Mfg., 1 spindle.
21" No. 210 Barnes, 4 spindle, 1⅛" cap.
21" Canedy Otto Upright, New.
21" and 24" Cincinnati Bickford upright.
21" Cinc. Bick. box column Mfg.
22" No. 121 Baker heavy duty.
21" Kokomo, 8H, BG, PF, Tapping Attmt.
24" No. 25 Foote Burt heavy.
24" No. 217 Baker, 2" capacity.
24" No. 314A Baker, late.
24", No. 321 Baker, 3" capacity.
No. 217 Baker, 3 spindle, 2" capacity.
24" No. 315 Baker, 3" capacity.
24" No. 310 Baker, capacity.
28" Aurora upright S.H., P.F., B.G.
No. 36 HO Baker 2 spindle inverted.

GEAR MACHINERY

No. 12 & type T Barber Colman.
Nos. 8H, 12H, 16HS and 18H Gould & Eberhardt.
No. 8M Fellows Red Line Checker.
Nos. 6 & 7125A Fellows shapers.
No. 120 Cleveland single spindle Rigid-hobber.
Nos. 1 and 5A Lees Bradner hobbers.
24 x 12 Flather auto. spur gear cutter.
Climatool and Lipe Chamferers.
36" Gleason bevel gear planer.
No. 1 Gleason testers and lappers.
8" Red Ring gear lapper.
"MAL" Barnes Hut-O-Lap gear lapper.
12" Red Ring gear shaver.
Red Ring gear speeders.
Illinois Involute gear tester.

GRINDERS, INTERNAL

No. 72A3 Heald Sizematic.
Nos. 72A3 and 72A5 Heald plain.
Nos. 72A3 and 72A5 Heald Cross slide head.
No. 75A Heald cross sliding head.
Size 1G Gremby Internal grd.
No. 42 Van Norman radius.
Bryant Nos. 16A16, 16CP16, 16-28, 16-36 and 24-26.
MH1 Saw-way hydraulic feed.

GRINDERS, SURFACE

No. 16A2 Blanchard 2 spdl. rotary.
16" No. 10 Blanchard rotary surface.
36" No. 16 Blanchard rotary.
16" and 24" No. 25A Heald rotary.
18" and 16" No. 22 Heald rotary.
8" Pratt & Whitney vert. rotary.
8" x 24" No. 7S Wilmarth & Morman.
8" x 22" No. 3 Abrasive.
8" x 24" No. 24 Abrasive vert. spindle.
14" x 36" Pratt & Whitney vertical spindle.
Nos. 00 and 1 Osterhelm oscillating type.

GRINDERS, CYLINDRICAL

6" x 18" No. 10 Brown & Sharpe.
6" x 18" Landis type C.
6" x 32" Brown & Sharpe No. 11.
10" x 18" Landis type C.
Norton Mechanical—10" x 18", 10" x 36" and 10" x 50".
Landis Mechanical 10" x 24" and 16" x 72".
10" x 36" Landis hydr. semi-auto.
10" x 36" Norton semi-auto.
10" x 36" No. 2½ Bath universal.
14" x 36" Cincinnati univ. type ER.
14" x 36" Landis "C" hydraulic.

GRINDERS, DISC

No. 228 Hanchett dbl. spdl. opposed disc.
No. 230 Hanchett dbl. spdl. opposed disc.
20" No. 226 Gardner single or dbl. disc.
20" No. 86 Gardner horizontal disc.
Nos. 00 and 1 Osterhoim oscillating grinder.

GRINDERS, MISCELLANEOUS

No. 2 Cincinnati centerless.
25 HP. No. 66 U. S. Vari-Speed sander.
Nos. 6G and 10G Sellers drill grinders.
No. 47 Ex-Cell-O Carbide.
Oliver Template Tool-Bit Grinder.
Nos. 1 and 4T Sellers tool grinder.
Gisholt tool grinder.
R6 Keller cutter and radius grinder.
30" Ingersoll cutter grinder.
No. 1 LeBlond tool and cutter.
No. 13 Brown & Sharpe universal tool grinder.
1, 2 and 3 H.P. Mall flexible shaft grinders.
Nos. 33 and 35 Excello thread grinder.
No. 42 Van Norman radius grinder.
3 H.P. Cincinnati buffer or polisher.
No. 2D and 2CD Gardner 2 spindle buffers.
10 H.P. Mitchell buffer, No. 5, 2 spindle.
2 H.P. Standard Electric double end grinder.
Nos. 4 and 7 Hisey Wolf double end grinder.
6", 8" and 12" U.S. Elec., double end grinders.
10" x 72" Landis crank.

HONERS & LAPPERS

Model MA Sunnen hone.
Model H-1 Micromatic hone.
No. 20S Norton Hyprolap.
No. 2F Norton hand lap.
No. 8S Gardner hand lap.

KEYSEATERS

3/16" No. 4 Mitts & Merrill.
1" No. 3 Mitts & Merrill.
1" No. 3 Baker.

LATHES, ENGINE

14" x 6' Lodge & Shipley.
16" x 30" centers Sebastian.
16" x 6' South Bend, motor in base.
16" x 10' American, taper attachment.
18" x 6' Lodge & Shipley, taper attachment.
18" x 8' Rockford.
20" x 8' Lodge & Shipley.
20" x 48" centers LeBlond.
20" x 10' ctrs. Wickes.
20" x 100" centers LeBlond, taper attachment.
20" x 9 centers Bridgeford.
20" x 15' LeBlond.

LATHES, TURRET

1¼", No. 3 Gisholt.
2", 1A & 3A Warner Swasey.
2½", No. 1S Acme.
No. 3AL and 28" Gisholt.
No. 5 Foster, motorized.
1 x 36 Jones & Lamson.
24" Bullard Vertical.
1¼" Oster.

MILLING MACHINES, MISCELLANEOUS

No. 0S Cincinnati horizontal & vertical.
No. 0S Cincinnati Rise and Fall.
Nos. 1-12, 1-18, 2-18 and 2-24 Cincinnati.
Kearney & Trecker Nos. 1H-12".
Cincinnati Hydromatic Nos. 24-36 and 56-90.
18", 24" and 48" Cincinnati duplex.
24" No. 12 Brown & Sharpe automatic.
No. 31 DeVlieg Supermill 36" feed.
Nos. 1 and 2 Kent Owens.
Nos. 1-14 Kent Owens hydraulic.
No. 1 Kent Owens semi-automatic.
No. 3 Kent Owens power feed.
Schuttoff thread miller.
Nos. 4 & 6 Lees Bradner univ. thread.
8" x 24" Lees Bradner thread miller.
Model CT-36 Lees Bradner thread miller.
No. 40 Lees Bradner thread miller, 12" hole.
Hall planetary, types C and D.
36" Newton 2-spindle rotary miller.
36" Ingersoll 2-spindle rotary miller.
42" Ingersoll 2-spindle rotary miller.
84" Ingersoll rotary, two-station, 6 spindle.
12" Cincinnati plain knee type mfg.
18" and 24" Cint. plain auto.
No. 32 Kempsmith mfg. miller.
Type 45 Producto-Matic miller.
Ingersoll drum type miller, duplex type.
18" x 21" x 22" Ingersoll planer type.
Model 12B Pratt & Whitney Profiler.
Pratt & Whitney Keller engraver or die sinker.
Type T Barber-Colman taper spline miller and gear hobber.
2-12" dia. rotary tables, hand and power feed for 2H K. & T. Miller.
2-16" rotary milling tables, hand and power feed, for No. 2 Cin. dial type miller.

MILLING MACHINES, PLAIN UNIVERSAL, VERTICAL

No. 2-AS Milwaukee plain.
No. 3 Ohio plain.
No. 3B Milwaukee plain.
No. 3 Van Norman duplex.
No. 3 Cincinnati Universal.
No. 3 Cincinnati vertical HSDT.
No. 3H Kearney & Trecker vertical.
No. 3 Kempsmith Maxmiller vertical.

SAWS, METAL

36" Tannewitz metal band.
No. 203 Campbell abrasive.
6" x 6" Toledo hack saw, New.
8" x 16" Kalamazoo metal cutting band.
4", 7" and 8" Higley cold saws.
5½" No. 15 Lea Simplex cold saw.
6" Nutter & Barnes cold saw.

SHAPERS & PLANERS

22" and 28" Gould & Eberhardt.
20" and 24" GEMCO universal, NEW.
24" Columbia universal.
30" x 24" x 6' Liberty openside planer.
36" x 36" x 8' Gray planer.
48" x 48" x 12' Cleveland Openside.
16" Bement Miles slotter.

TAPPERS

Hauch radial arm.
No. 1 Bakewell.
Nos. 2, 2X & 2BG Garvin.
⅞-16" Rickert Shafer.
Hamilton precision bench.

TESTING MACHINES

Steel City Brinnell.
230,000 in. lbs. Tinius Olsen torsion.
22 lb. Tinius Olsen drop tester.

This is a partial list only. Send for complete stock list.

MILES MACHINERY CO... SAGINAW, MICH.

WIGGLESWORTH means REAL WORTH

WE HAVE "HARD TO GET" MACHINE TOOLS

DRILLS

No. 2BL NATCO "Holesteel", M.D.

No. 1LMS LELAND-GIFFORD 6 Spindle, M.D.

No. H-3 BARNES Hydram Drill

MILLERS

No. 08 CINCINNATI Plain & Vertical Millers

No. 2HS CINCINNATI Dial Type Vertical

No. 3H KEARNEY & TRECKER Vertical

No. 2G KEMPSMITH Universal Millers, M.D.

4½"x36" P & W Model C Thread Miller

6" TAYLOR & FENN Duplex Spl. Millers, M54 & M80

GRINDERS

No. 5 BROWN & SHARPE Pl. Cyl. Grinder

6"x18" LANDIS TYPE C PL., M.D.

INGERSOLL
Planer Type Miller
36"x36"x12', 40 H.P., A.C. M.D.
Three Heads. Late.

16"x96" LANDIS Type B Gap Cyl., M.D.

No. 11 BLANCHARD Vert. Rotary Surf. Grdr.

No. 33 ABRASIVE Surface Grinder

LATHES

No. 8A WADE Toolmaker Lathe

10"x20" MONARCH Model EE Toolroom

12"x30" MONARCH Model CK Toolroom

14"x30" HENDEY Geared Head, M.D.

No. 43 LUCAS
4½" Bar Horizontal Boring, Drilling and Milling Machine, M.D.

14"x30" LeBLOND Geared Head, M.D.

16"x54" AMERICAN Multi Production "Pacemaker" Lathe

18"x36" LODGE & SHIPLEY Geared Hd., M.D.

20"x48" AMERICAN Multi Production "Pacemaker" Lathe

TURRET LATHES

No. 2 B & O Geared Electric Turret, 1946

No. 2A & 4A W & S Saddle Type Univ., M.D.

MISCELLANEOUS

No. 12 FELLOWS Gear Shaver

725A FELLOWS Gear Shapers

No. 49 HEALD Single End Boring Machine

No. H-1 MICROMATIC Hone, M.D.

No. 145 CLEVELAND "Rigidhobber", M.D.

12" ROCKFORD Hydraulic Shaper

No. 1½x50 P & W 2 Spdle. Reaming Machine

20" GOULD & EBERHARDT Industrial Shaper

36" CINCINNATI H.D. Shaper

WIGGLESWORTH MACHINERY CO.

201 BENT STREET, CAMBRIDGE 41, MASS.

EXCELLENT MACHINE TOOLS IMMEDIATELY AVAILABLE

MILLS

CINCINNATI Hypro planer type, 4 head 48" x 48" x 12'
CINCINNATI No. 2-18 production
U.S. Multimillers, rise and fall
CINCINNATI Plain 0-8 production, horiz.
CINCINNATI 4-48, rise and fall
CINCINNATI Mfg. no. 18 production
CINCINNATI No. 3 plain horiz. med. spd. dial type
SUNDSTRAND No. 0
SUNDSTRAND No. 1
CINCINNATI No. 1-12 production
2 OHIO production No. 1236

GRINDERS

NORTON 14" x 72" Univ., 1943
NORTON 16/26" x 36" cyl.
LANDIS 10" x 24" cyl. Univ.
NORTON No. 20 tool cutter, Univ.
LANDIS Type D crankshaft, 24" x 48"
GARDNER 120A opposed disc.
CINCINNATI No. 2 tool and cutter
2—BROWN & SHARPE No. 13 tool and cutter
HEALD 72A
HEALD No. 50 cylinder
No. 50 EXCELLO Thread grinder, excellent cond. late

SCREW MACHINERY — Automatic

1—GREENLEE 6 spdl. 1"
6—CLEVELAND Mod. A 1⅜"
1—GREENLEE 4 spdl. 2¾" cap.
9—INDEX No. 0 5 16" cap.
2—NATIONAL ACME GRIDLEY RA-4 3 5/16"
1—CLEVELAND 2½" x 18" Model B

GEAR MACHINERY

2—BARBER COLMAN Type V hobbers
6—BARBER COLMAN dbl. overarm hobbers No. 12 dbl. Index
3—BARBER COLMAN No. 3 hobbers
3—BARBER COLMAN No. 3 hob sharpeners
1—BARBER COLMAN No. HRS hob sharpener
1—NATIONAL Red ring checker

PUNCH PRESSES

MINSTER 50 — 5½ — 84 106 ton
CECO Stamp 66" x 60"
CLEVELAND trim and forge 150 ton
WATERBURY FARRELL trim and forge 80 ton
TOLEDO No. 56
GREENERD Hyd. arbor 30 ton
WALSH 5⅝" 65 ton BG, late

LATHES

LODGE & SHIPLEY 20" x 54", late
AXELSON 18" x 96", late
LEHMAN 18" x 30" TA ch., late
CENTURY 18" x 48", 1945
1—LEBLOND production 17 RP
2—LEBLOND production 13 RP

DRILLS

BARNES 2 spdl. No. 4 MT PF
AVEY 2 spdl. PF No. 3 taper
FOSDICK 4 spdl. (1 tap) No. 3 MT PF
FOOTBURT No. 2 MT, 6 spdl. PF
NATCO B 225 SS hyd. feed
LELAND GIFFORD 2 spdl. No. 2 MT
CARLTON radial 3'11"
AVEY 4 spdl. size 2 MA 6, PF
CINCINNATI BICKFORD 6'17", radial
3—#242 BARNES SS #5MT
FOOTBURT 4 spdl. #2MT #2-12
DRESES 5'17" radial
BARNES #242 4 spdl. PF No. 4MT
EDLUND 2—B8
BARNES No. 242 4 spdl.

TURRET LATHES

MOREY No. 2G tooling BF
2—WARNER SWASEY No. 1
JONES LAMSON No. 4 chucker
BARDONS OLIVER No. 7
WARNER SWASEY No. 3A Ser. 327441, excell.
GISHOLT No. 2L Ser. 666-4
2—WARNER SWASEY No. 2A rebuilt Ser. 492176

BORING MACHINES

GIDDING & LEWIS No. 45
HEALD 47A
EXCELLO 112C
BULLARD 24" Ser. 8306
LUCAS No. 31 3" bor, table type
HEALD 48A
GISHOLT 84", vertical

HEADERS

MANVILLE 250 C DSSD
NATIONAL 1⅛" x 2¼", 1941, high speed
MANVILLE 250C SSSD, ball
MANVILLE 250C SSSD, rivet

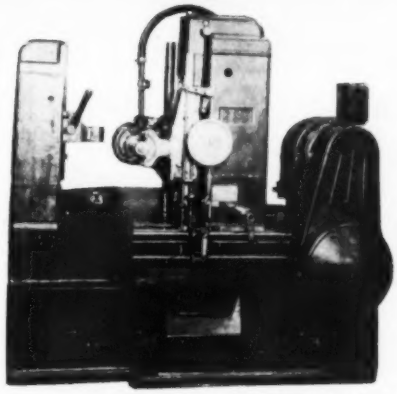
MISCELLANEOUS

BAKEWELL Bench tapper No. 0
ETNA Swager Mod. 72, ¾"
MANVILLE Thread roller, No. 4B
MARVEL Power hack saw Mod. 6A
CONSOLIDATED Bar shear No. 1
BUFFALO Iron worker No. 1½
3—LEES BRADNER No. CT12-36, threadmiller
MOTCH & MERRYWEATHER No. 3 cold saw
LANDIS 1" bolt threader

JOSEPH BEHR AND SONS, INC.

1218 SEMINARY STREET **ROCKFORD, ILL.**

LATEST TYPE *Nearly New* MACHINES



GOULD & EBERHARDT No. 12H Hobber Latest Type

BORING MILLS—HORIZONTAL
DETRICK & HARVEY 4" bar, Floor Type, M.D.
EXCELLO No. 54 Double End Borer, latest
NILES 5" & 8" bar, floor type, M.D.
SELLERS 5" Bar Table, Latest

BORING MILLS—VERTICAL
BULLARD 16" and 8", 6 Spindle Type A Mult-au-matic, M.D.
BULLARD 24", 36", 42" "NEW ERA", Motor Drive
COLBURN 72", 2-swivel heads, PRT, M.D.
KING 52"; 2 swivel heads; P.R.T.
KING 62"; swivel, turret & side heads; high speed; latest type
NILES-BEMENT-POND 144" heavy duty; 2 hds.; M.D.
NILES 100", 2 swivel heads, PRT, DC, M.D.

BROACHES
CINCINNATI 1-30 Duplex Vert. Hydro, Latest Type
AMERICAN Model 6-G Hyd. Rifle Broach, latest type
LaPOINTE No. 5-42-S.R.V. Hydraulic; latest

DRILLS—MISCELLANEOUS
BARNES H-2 Hydram; hydr. cap. 2"; M.D. Latest
BARNES 20" 4 spindle Camel Back; M.D. Latest
BARNES No. 420 Deep Hole, Latest Type
BARNES H-3, Hydram, Hyd., Latest
NATCO D-5 Adjustable, Multiple, Late Type
LeBLOND No. 2 Deep Hole, Latest Type
BAUSH 1½"x30" Deep Hole, Latest Type
FOOTE-BURT 20 Sp. Mult., Latest
NATCO No. 4AL 30 Multiple spindles, Latest

GRINDERS—CYL., PLAIN & UNIV.
BROWN & SHARPE No. 1, 2, 3, 4, Univ.
CINCINNATI 16"x36" Univ. Mod. ER, Latest
LANDIS 4x12, Type H plain hyd., Latest
LANDIS 6"x18", Type C, Pl. Hyd., Latest
LANDIS 14"x48" Type C, Univ. Hydr, Latest
LANDIS 29"x130" Centers, Plain, Motor Dr.
NORTON 10"x72" Type C, Plain, Latest
NORTON Model D-86, 17"x72" centers crankpin, hydraulic—Latest Type

GRINDERS—MISCELLANEOUS
BRYANT No. 3, 6, 16-C-16, 16-CP-16, 24-36" Internal Hydraulic, Latest Type
GLEASON No. 12 Tool Sharpener, Latest
HEALD 72A5 "Gagematic" Internal, Latest
HEALD No. 72A3 "Gagematic", Motor Dr.
HEALD 72A3, 72A5, Internal, Latest
KEARNEY & TRECKER Face Mill, Latest
LA POINTE 60" Univ. Broach Sharpener, Latest
SHEFFIELD Micro-Form Grinder, Latest
THOMPSON 6"x48" Auto., rd. broach, M.D.
VAN NORMAN 639, Osc. Radius, Latest
VAN NORMAN #666 crankshaft; max. dia. 20" M.D. Latest

GEAR CUTTING EQUIPMENT
BARBER COLMAN No. 12 Hobber, M.D.
BILGRAM 6" & 16" cap. Bevel Gear Gen., MD
BROWN & SHARPE No. 13 Spur, Bevel Cutter
CROSS No. 1, #50 Tooth Rounder, Motor Dr
FELLOWS Nos. 61A, 6Z2, 7A, 72, 715, 712b 712, 725, 7, 77 H S Gear Shapers, Latest
FELLOWS No. 12M Involute Measuring Inst., Latest
FELLOWS No. 13LS Lapper, Latest Type
GLEASON 3", 12" straight bevel gen., Latest
GLEASON 24", 37", 77", 96" Bevel Gear Planer, M.D.
GLEASON 4, 6, 18 Bevel and Hypoid Tester
GLEASON No. 14 Hypoid Grinder, Latest
GOULD & EBERHARDT 12H Hobber, Latest
GOULD & EBERHARDT 96 H Hobber, M.D.
GOULD & EBERHARDT 18H Hobber, M.D.
NEWARK No. 5 Gear Hobber, 72" cap., P.R.T., DIFFERENTIAL INFEED, M.D.
P. & W. 10" Gear Grinder, hyd., Latest
SCHUCHARDT & SCHUTTE 1 Hobber, M.D.

GRINDERS—SURFACE
ABRASIVE 3B 8"x24" Hyd. vert. Latest Type
ABRASIVE No. 34 Vert. Spdle. M.D., Latest
BLANCHARD No. 16A Vert., Dial Feed, M.D.
HEALD No. 22 Rot., 12" chuck, Latest Type
P. & W. 14"x36" "B" Hydr., Latest

JIG BORERS
SOCIETE GENEVOISE (SIPP) No. 4 Precision, Table 19"x27". Motor Drive

LATHES—ENGINE & MFG.
AMERICAN 36"x40' centers geared, M.D.
AMERICAN 36"x360" cent., 2 carriages, M.D.
JONES & LAMSON "Fay" 24"x24", 20"x28". Auto., Latest
LeBLOND 16"x30" Centers, Auto., Latest
LODGE & SHIPLEY No. 5x24" and 96" Centers, "Duomatic" Timken, Latest
LoSWING 4x60, 4x84, 8x60, 8x108, Latest
MONARCH 10"x20" Mod. EE, Latest
MONARCH 16"x28" centers, geared, M.D.
NILES 30"x11' centers; Time-Saver; M.D. Latest
MONARCH 22"x456", 3 carr. Tim. CM, M.D.
NILES "Time-saver" 30"x50' Boring, Timken, Latest
PRATT & WHITNEY 10"x20" centers, Bench, Latest
SPRINGFIELD 14"x43", 16"x24", Geared M.D.

LATHES—TURRET
GISHOLT Nos. 1L, 2L, Univ. Timken, Lat.
MOREY No. 2G, No. 3, No. 4, Timken, Lat.
POTTER & JOHNSON 5D2E, Timken, Latest Type
WARNER & SWASEY 3A Univ., Motor Dr.

LATHES—RELIEVING
CLEVELAND 12"x16" Centers Cutter Reliever, M.D.
U. S. TOOL 810-B Cutter Reliever, Latest

MILLING MACHINES—PLAIN
BROWN & SHARPE No. 000, Timken, Lat.
BROWN & SHARPE No. 3B, Timken, Latest
CINCINNATI 0-8, Auto, Latest
CINCINNATI No. 3, 4, 5, High Power, M.D.
CINCINNATI 4-36, 34-36 Hydromatic, Simpler, Latest
CINCINNATI 4-48, 4 Sp., Tracer Latest
KEMPSMITH No. 4 Maximiller, Timken, Latest
SUNDSTRAND No. 3 Rigidmil, Timken, M.D.
U. S. Mod MM-1-6 Auto, Latest

MILLING MACHINES—MFG.
HALL Style D Planetary, Latest
INGERSOLL 42"x36"x12' adj. rail, 4 hds., M.D.
INGERSOLL 32 x 24 x 16' Planer Type, 2 hds., M.D.
INGERSOLL 30"x42"x12' Adj. Rail Slab, M.D.
INGERSOLL 42"x42"x16' 4 hds., adj. rail, tubular ways, Latest
SUNDSTRAND Model 3A Duplex 42" Feed, Latest
TAYLOR & FENN M80 Duplex Spline, Lat.

MILLING MACHINES—VERT.
CINCINNATI No. 08, TIMKEN, Latest Type
SUNDSTRAND No. 3 Profile & Channel, Latest

MILLING MACHINES—THRD.
HALL Style D, Planetary, Latest
LEES BRADNER model HT, 12"x 54" centers, Latest
MOREY 12x30", 60", 120", 190" centers, Latest
PRATT & WHITNEY 4½"x12" Model C, Latest Type
ESPEN LUCAS No. 670—20" cap. hydr., Latest

SAWS
HELLER Model SS-1, 6¾" capacity Cold Saw, M.D.
MODERN No. 3, 3½" capacity Cut-off, Latest Type
PEERLESS 14"x14" Hydraulic, Latest Type

PLANERS
CLEVELAND 48"x48"x12' Open-side, M.D.

WATCH THIS PAGE

For MODERN high quality machine tools nearly all built new since 1941. These tools are priced well within your equipment budget. *Wire, write or phone for pictures, details and prices, today.*

BETTS (CONSOLIDATED) 108"x84"x50', 4 hds. P.R.T., Box Table, DC Reversing M.D.
BETTS (CONSOLIDATED) 84"x92"x16', 4 hds. P.R.T. Box Table, DC Reversing M.D.
LIBERTY 48"x48"x16' 4 hds. vari-voltage drive—Latest
LIBERTY 72"x48"x20' 4 hds. Convertible, openside vari-voltage dr.—Latest
NILES 108"x84"x42', 4 hds., Rapid Traverse, Box Table, D.C. Motor Drive
NILES 30"x30"x10'; 2 Hds, Hyd, M.D.
SELLERS 60"x60"x12' 4 hds. vari-voltage drive P.R.T., Latest Type
WOODWARD & POWELL 54"x54"x20', 4 hhds., M.D.

PRESSES
BIRDSBORO 325 ton, vert. hyd., latest
CLEARING K-1200-30, 200 ton Knuckle Joint Press
GLEASON 15", 25", Quenching, Hyd., M.D.
LAKE ERIE 500 ton Vert., Hyd., Latest
NIAGARA No. 512, 400 tons, Late Type
NIAGARA No. 58, 106 tons, Late Type

SHAPERS
AMERICAN 20" Heavy Duty, Motor Drive
CINCINNATI 16", 20", 24" Hi. Sp. Latest
LAMAIRE 18" Vertical, Hydraulic, Latest
PRATT & WHITNEY 6" Vertical, Motor Dr.

SHEARS—POWER
PELS Type ME 10 Univ. Ironworker, M. D.
QUICKWORK ¾", 1" Capacity, Rotary, M.D.

MISCELLANEOUS
ACME 2" forging, upsetting, Latest Type
BAKER No. 5 Keyseater, Motor Drive
BAKEWELL No. 1, No. 1B Prec. Tapper
BARNES No. 172, 206H, 307, Vertical Hone, Hyd., Self-oiling, Latest
DeLAVAL No. 194 Coolant Clarifier, Latest
FISCHER #1, #2 Oil Groovers, M.D., Latest

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SHEARS

CLEVELAND Vert. Trimming; type #443 cap. ½"x10"
COVINGTON Gate—cap. ¼"x50"
FERRACUTE PG-4, 1⅝" stroke
GARRISON Gate; cap. 1"x132"
LEWIS No. 5½ Alligator; stroke 5¼"
LONG & ALLSTATTER Gate; "F" 1"x114"; "R" ½" x100"; "A" ⅝"x60"
LONG & ALLSTATTER Bolt; ½" rd.
MACKINTOSH HEMPHILL Bar; stroke 3½"
QUICKWORK Rotary ¼"
UNITED Alligator, 3" stroke

PRESSES—Hydraulic

BETHLEHEM 1200 ton; 66" stroke
MACKINTOSH-HEMPHILL (Upward) strokes 60", 36", 30", 24"
NILES BEMENT POND 4-post, 36" stroke w/ intensifier
PRESSED STEEL 21", 22" strokes
SOUTHWARK 5'6" stroke w/ intensifier

PRESSES—POWER

BLISS No. 10A, 12" stroke, 450 tons
BLISS No. 15, 20" stroke, 1200 tons
FERRACUTE 100 ton cap., 2" stroke
TOLEDO No. 88 single crank

POWER BRAKES

DREIS & KRUMP 12x½"; leaf-type

PUNCHES

HILLES & JONES No. 2 Horiz. 1½" strk. cap 1⅛"
HILLES & JONES No. 3 Vert. 2½" strk. cap 1" dia.
HILLES & JONES No. 2 Horiz. 1¼" stroke cap 1⅛" dia.
HILLES & JONES No. 3 Horiz. 1⅝" stroke, cap 1⅛" dia.
HILLES & JONES No. 3 Dble. Hd. Vert. 2" stroke, cap. 1⅛" dia.
HILLES & JONES No. 3 Dble. Hd. Vert. 1⅝" stroke, cap. 1⅛" dia.
HILLES & JONES No. 2 Vert. 1½ stroke, cap. 1¼" dia.
HILLES & JONES No. 6 Vert. double head; 3" stroke
LONG & ALLSTATTER No. 2 Vert. 1½" stroke, cap. 1" dia.
LONG & ALLSTATTER Size B Dble Hd Vert. 2" stroke; cap 1" dia.
LONG & ALLSTATTER No. 3 Vert. 1½" stroke, cap. ⅞" dia.
CLEVELAND Mult. type w/ spacing table; 3" stroke
CLEVELAND No. 1 Mult. 6" stroke
CLEVELAND Vert. 500 ton IX; 6" strk.
CLEVELAND Mult. 3" x 120"
CLEVELAND EF Vert. 1½" stroke
CLEVELAND Type C Vertical; 1½" stroke
CLEVELAND Type C Dble Hd Vertical 1¼" stroke
CLEVELAND Type Z Punch & Bar Shear 4" stroke
CLEVELAND No. 1 Mult. Angle 2½" stroke
CLEVELAND "O" Dble. End; 1⅝" stroke
CLEVELAND Vertical No. 30 IX, 3" stroke
CLEVELAND Type A-1 Horiz. 1⅝" stroke
COVINGTON Mult. 6" stroke
COVINGTON No. 2 Vert. 2" stroke
MASSILLON No. 5 Ver. 2" stroke
MASSILLON No. 5 Ver. 1½" stroke
MASSILLON No. 5 Vert. 1¾" stroke
WILLIAMS & WHITE No. 17 Vert. cap 1x½"
THOMAS No. 20 Mult. Moveable bolsters and spacing table—3" stroke
THOMAS No. 16, 3" stroke w/ spacing table
SOUTHWARK Mult; 400 ton, 7" stroke
MACKINTOSH HEMPHILL Vert. 2½" stroke

ROLLS—Bending & Straightening

CLEVELAND—Straightening—cap ⅜"x4'
HILLES & JONES Bending; length rolls 8" dia.

BENDING MACHINES

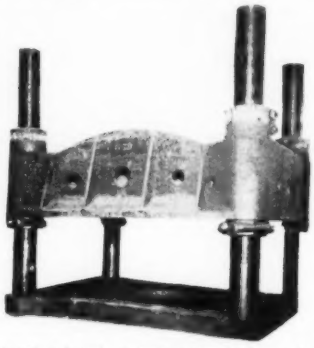
CLEVELAND No. 1½ cap 15" stand. I Beam
WILLIAMS & WHITE No. 2 Rail Bender 1¾" stroke

FORGING MACHINES—Upsetters

AJAX—Horizontal M.D. 1½", 2", 3½", 4", 5" cap.
AJAX Auto. Rivet; size openings 10x13

FORGING ROLLS

AJAX Brake Shoe Key
AJAX Lever Type



MILES 36" stroke hydraulic (Upward) Press with intensifier

BULLDOZERS—Horizontal

PRESSED STEEL CAR—Hydraulic
WILLIAMS & WHITE No. 2
AJAX No. 7; 20" stroke

WHEEL PRESSES—Hydraulic

NILES BEMENT POND XX 400 ton

BORING MILLS—Vertical

BICKFORD 72", 2 heads
BULLARD 36", 42" N.E. type
NILES BEMENT POND 10-ft.

BOLT THREADERS

NATIONAL Double type—cap. 1"
NATIONAL Single type cap—2½"
LANDIS Double Head; cap. 2½"
LANDIS Double Head; cap. 2"

CENTERING MACHINES

WHITON 5"x8', 5½"x10' cap.
WHITON Double Spindle 4"x8' cap.
WHITON Double End Dr.—16"x66"

DRILL PRESSES—Single Spindle

BARNES 22", 28"
COLBURN D-2, D-4, D-5, D-6
BAKER w/ tapping attachment
PRENTIS 18"

DRILLS—Multiple Spindle

BAUSH 8 spdle. hd. 24x40"
MOLINE 6 spindle
NATCO No. 30, 12 spindles

DRILLS—RADIAL

AMERICAN 5' & 6', 15" columns
PRENTISS BROS. 4'9"
WESTERN 6' low-hung (1943)

LATHES

AMERICAN 18"x8', 24"x12'
BRIDGEPORT 10"x5'
BARDONS & OLIVER No. 1 (turret)
BOYE & EMMES 26"x12'; 24"x12'; 20"x13'; 18"x8'
LeBLOND 18", 17"x8', 21"x10', 28"x16'
PITTSBURGH 38"x18'
SCHUMACHER & BOYE 26"x13'

MILLING MACHINES

JACKSON Vert. Mill & Die Slotter

GEAR CUTTERS

GOULD & EBERHARDT 60x12" Auto.

PLANERS

CLEVELAND 48"x48"x12' Openside; 3 hds.
DETRICK & HARVEY 48"x48"x14' 4 hds.
DETRICK & HARVEY 42"x42"x12' 4 hds.
GRAY 36"x36"x8'; 2 hds.
NILES BEMENT POND 48"x48"x12' 4 hds.

HAMMERS

ERIE single frame 2500#, 1100#
ERIE double frame 4000#
CHAMBERSBURG double frame 800#, 600#, 1500#
NILES BEMENT POND double frame forging 5000#
BRADLEY Cushion Hevel 80#
BRADLEY strap type 200#
BRADLEY Upright hevel type 500#

RIVETERS—HYDRAULIC

CHICAGO PNEUMATIC mounted w/ stand
CHAMBERSBURG Pinch—dio gaps 8", 10½", 11½", 11¾", 13"
CHAMBERSBURG Deep Gap; dio gap 25"
MACKINTOSH-HEMPHILL Deep Gap; gap 25"
NILES BEMENT POND pinch; dio gap 9", 10"
WALKER pinch—dio gap 14"
WOOD Deep Gap and Pinch, 10½", 12"

RIVETERS—PORTABLE PNEUMATIC

Approx. 75 machines:
Gaps from 3½" to 72"
Strokes from 2¾" to 10"
RYERSON, HANNA, ALLEN, BAIRD, WATSON-STILLMAN

CARWHEEL BORING MILLS

BETTS 48"; table dia. 52"

AXLE LATHES

NILES double head—2 roughers; 2 finishers
NILES double head Burnishers
PUTNAM Dble End Center Drive center dist. 9'
BRIDGEFORD center drive, double end—12½"x9'

PIPE MACHINERY

NATIONAL 1" double head
NATIONAL 2½" single head
LANDIS 2½" double head
LANDIS 2" double head
PRESSED STEEL CAR 27" pipe bender
WALLACE pipe bender, 1 to 2" steel pipe

SAWS

HIGLEY No. 16—Cold, 20"
WRIGHT Band Hack, 15'10"
RACINE 6x6 high speed
ESPEN LUCAS Cold, 6" rd cap.
RYERSON 48" friction
GUSTAV WAGNER Cold; type DO2, 22"
AJAX Hot Saw & Burring, No. 2

WELDERS—D.C. 230 V.

HOBART ARC, 12 KW 300 amps M.G. set
WESTINGHOUSE 400 amps Flex-Arc M.G. set
WESTINGHOUSE 75 KW 300 amps Arc M.G. set
WESTINGHOUSE 300 amps Flex-Arc M.G. set

WELDING POSITIONERS

RANSOME hand tilt and turn; 26" dia. table

TURBO GENERATORS

WESTINGHOUSE — Parsons Exhaust type 3750 KW; 1000 KW; 625 KW; 500 KW

TURBINES

STANDARD size 20 HP steam pressure 150#
STANDARD size 50 HP steam pressure 150#
TERRY; 75 HP and 125 HP
WESTINGHOUSE 50 KW; steam pressure 150#

TESTING MACHINES

TINIUS OLSEN Universal, cap. 600,000#
TINIUS OLSEN Cap. 50,000#

CONVEYORS

BONNOT CO. Belt 50' and 85'
CHAIN BELT Port. Apron type; 24' length
DOW CO. Port. Apron type; 34' length
HEYL & PATTERSON—50'

YARD CRANE LOCOMOTIVE

BROWNING—cap 25 tons—80' boom
INDUSTRIAL—cap 30 tons, 50' boom
LINK BELT cap 25 tons, 80' boom

GRIT BLAST

PANGBORN type car blast, approx. 16'x20'x50'

PARTIAL LIST—**There are Air Compressors, Hydraulic Pumps, Grinders, Scales, Car Pullers, Woodworking Machines *plus* about $300,000.00 worth of SMALL TOOLS including Chain Blocks, Reamers, Drills, Milling Cutters, etc.**

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POWER PRESSES

TOGGLE DRAW PRESSES

BLISS, No. 5A TOGGLE DRAW PRESS, SINGLE CRANK, TIE-ROD FRAME, FRICTION CLUTCH, 8" DIA. CRANKSHAFT, MOTOR-DRIVEN. WILL DRAW AND LIFT OUT 12½".

BLISS Nos. 1½, 1½B, 3½A, 3½B, 3½C, 4, 4A & 16
TOLEDO Nos. 164½ and 174

INCLINABLE (O.B.I.)

BLISS Nos. 18, 19, 19C, 20, 20B, 21, 21½ & 23
FERRACUTE Nos. C2, C3, C4 and C5
STANDARD Nos. 5B, 8S and 10S
V & O Nos. 00, 0, 01, 1, 2, 4, 101, 102, 103 & 104. Flywheel & Geared. Some with Dial & Roll Feeds
ZEH & HAHNEMANN Nos. 36-2, 36-4 & 36-5

GAP FRAME AND DEEP THROAT

3—TOLEDO No. 77A GAP FRAME-GEARED, BED—20" x 36", 12" STROKE. BLISS 104 & 105 GAP FRAME, A.C. M.D. OBI.

BLISS Nos. 122, 31, 58, 61 & 62, M.D.
BLISS-STYLES Nos. 2, 3, 4 & 5
BLISS-TOLEDO No. 77 Geared
FERRACUTE P-1, P-2, P-3, P-4, P-5 M. D.
MICHIGAN Deep Throat Punchrs 30" & 36"
TOLEDO Nos. 15 & 17 Deep Throat

DOUBLE ACTION—CUT & DRAW

ADRIANCE Nos. 44 & 46 Strip & Roll Feeds
ADRIANCE 16 Die Crown Cap Press
BAIRD Nos. 2 & 3 Tandem Roll Feed Transfer
BLISS Nos. 1, 1½B, 3½, 5, 6 & 7 Cam & Crank
TOLEDO No. 66 Geared
V & O Nos. 10, 11 & 15 with Roll Feeds
WATERBURY-FARREL Nos. 1, 2, 2½ with Feeds
WATERBURY 5 Ton High Speed, Roll Feed and Scrap Cutter

STRAIGHT SIDE

HIGH SPEED PRESSES
HENRY & WRIGHT 25 & 50 TON DOUBLE ROLL FEEDS & SCRAP CUTTERS, REEVES DRIVE.

BLISS Nos. 37½, 52, 74½, 75½, 76½, 77½ & 78½, Geared & Flywheel, with Air Cushion. Some with Side Shears for Forge Work
BLISS Nos. 305 & 307½ (New in '42, '44)
FERRACUTE E-3 & E-4 with Roll Feeds
FERRACUTE DG-53 & DG-54 Geared
FERRACUTE D 251 Twin-geared 250 Ton, Friction Clutch with New Air Cushion
NIAGARA No. 510 Geared with Side Shear
TOLEDO No. 59¼, Twin Flywheel Forging, 400 Ton

DOUBLE CRANK

BLISS 25½ Gap Frame 108" bed, 150 ton Single Geared
CLEVELAND 65G96—150 Ton
BLISS Nos. 102, 103S & 106 Transfer, Gap Type
FERRACUTE 36" & 52" Geared
NIAGARA No. 67C—48"x30", Geared Spring Cushion
TOLEDO 93½C, 36"x48", 36" Roll Feed, 3" Stroke Single Geared, M.D.
TOLEDO 92B—42"x30" Tie-rod Frame
V & O—24"x20" with Double Roll Feed
WILLIAMS & WHITE, 300 & 450 ton Gap Frame Gang Punches 12' bed
WILLIAMS & WHITE No. 31 Gang Punch, M. D.

KNUCKLE JOINT & PERCUSSION

BLISS 3M—50 Ton Geared M. D., No. 22A—150 ton
FERRACUTE E51—75 ton and EG54—400 ton
WATERBURY 300 Ton, Geared, Steel Frame
ZEH & HAHNEMANN Nos. 8½, 10 and 12

WILLIAMS & WHITE 29U BULLDOZER

HORNING & WIRING

ADRIANCE Nos. 23 & 24
BLISS Nos. 16, 39, 40 & 41 Adj. Tables
FERRACUTE Nos. CA-4 & CAG-4 Motor Driven

WATERBURY-FARREL PRODUCTION

EYELET PRESSES Nos. 09 and 6600
Dial Feed Presses 5 to 40 Ton, M. D.
Collapsible Tube Equipment

WIRE WORKING

BAIRD, NILSON, MANVILLE FOUR SLIDES, NOS. 00, 0, 1, 2, 3, 4, 3-20, 4-26, M. D.
U. S. TOOL NO. 22 MULTI-SLIDES, M. D.
BLISS & TOLEDO Automatic Ring Machines
SLEEPER & HARTLEY UNIVERSAL SPRING COILERS Nos. 0, 1, 2, 3, 3½, 4 & 5
SLEEPER & HARTLEY Nos. 1 & 2 Torsion Coilers
WELLS SPRING MACHINERY, COILERS, KNOTTERS & CRIMPERS
LEWIS, SHUSTER, WELLS AUTOMATIC WIRE STRAIGHTEN & CUTTING MACHINES, CAPACITY 1/16" to ⅝"
ARTOS Wire Cutting & Stripping Machines
NILSON AUTOMATIC CHAIN MACHINES
NATIONAL & PERKINS NAIL MACHINES
VAUGHN No. 8 Single & Double Deck Metoblocs
WATERBURY Nos. 1, 2 and 3 Bull Blocks
WATERBURY No. 0 Sleeve-type Continuous Wire Drawing Machines, A.C. Motor Drive
WATERBURY-FARREL Nos. 0 & 1 Slip Roll, No. 1 Stop Cone & 6 & 8 Die Upright Continuous Wire Drawers
STANDARD, TORRINGTON, LANCELIER, ETNA WIRE & TUBE SWAGERS Nos. 1, 2, 3, 4 & 5

MACHINERY FOR THE PRODUCTION OF WIRE SPECIALTIES, WIRE STAPLES, HAIR & BOB PINS, PAPER CLIPS, STRAIGHT & SAFETY PINS, NAILS, WIRE BASKETS & WIRE GUARDS

ROLLING MILLS

STANDARD No. 61 TURKS HEAD M.D.

RUESCH JEWELERS ROLLS
STANDARD Two-High Roller Bearing 5"x8"
UNITED ENGINEERING 6"x14" & 8"x10"
BLAKE & JOHNSON Wire Flattening Mill—3"x10"
WATERBURY 12"x12" Close-Coupled Mill

THREE HIGH ROD MILL COMPLETE WITH MOTOR, COILER AND LARGE QUANTITY EXTRA EQUIPMENT.

BOLT, SCREW, NUT & RIVET EQUIP.

WATERBURY-FARREL No. 5—⅝" Double Stroke Solid Die Cold Header with Hogue Wire Drawer
WATERBURY-FARREL Triple Stroke Solid Die Header Cap. ½"x6"
WATERBURY & MANVILLE Double & Single Stroke Cold Headers, Capacities 1/16" to ⅝"
ROD HEADERS ¼" & ⅜" Capacity
Nos. 1 & 2 Auto Screw Slotters
MANVILLE Auto. Wood Screw Machine
WATERBURY-FARREL Nos. 0, 10, 20, 30, 40, 50 Thread Rollers, Hand and Hopper Feed, M. D.
NATIONAL 3/16"-¼", ⅜", ½" & ⅝" Auto. Bent Shank Nut Tappers (Standard & Precision)

NATIONAL ⅛" DOUBLE STROKE SOLID DIE
NATIONAL 1" THREAD ROLLER, M.D.

SHEET METAL

POWER SHEARS

HILLES & JONES ¾" x 5' capacity—20" gap
NIAGARA & PEXTO 30", 36", 72", 96", 132" Square Shears, Foot & Power
CANTON FOUNDRY 11' 14 Ga. Power Shear
PELS HEAVY DUTY BEAM SHEAR, Capacity up to 12" Beam or Channel at one stroke
BLISS, NIAGARA, QUICKWORK, MARSHALLTON, DEEP THROAT & THROATLESS SHEARS
NIAGARA No. 15 Circle Shears

HALLDEN 12" CAP., STRIP STRAIGHTENING & CUTTING, M.D.
MANVILLE SHAPE & TUBE STRAIGHTENER WITH FLYING SAW CUTOFF.

SLITTERS

BLISS, ADRIANCE 30" x 30" Gang Slitters
WATERBURY GANG SLITTERS with take-up

ROLL FORMERS

RAFTER 8-STAND, 10" WIDE MD
KANE & ROACH 6 STAND, A.C. M.D.

RAFTER 5 Stand Duplex, Door Bucks
YODER 5-Stand with ACL AC-1 Cutoff
PITTSBURGH 4 & 5 Stand Tube Formers

POWER BRAKES

CHICAGO 6'x⅛" Capacity Box and Pan Brake AC Motor Drive
OHL 10'x10 Gage Press Brake

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FEDERAL 700 KVA PROJECTION TYPE WELDER, AIR OPERATED, 99% NEW.

ELECTRIC SPOT & BUTT WELDERS IN STOCK. 5 to 700 KVA

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BLISS & McDONALD STRIP FEED PRESSES
NIAGARA No. 9 Steel Drum Seamer
BLISS & NIAGARA Power Beaders & Flangers
BLISS & V & O Thread Rollers & Trimmers
BLISS Double & Lock Seamers
CAMERON Body-makers

MISCELLANEOUS

AMERICAN 36"—H 9 Ton Broach, 1943
BILLINGS & SPENCER 600 lb., 1200 lb., 2500 lb. Board Drop Hammers
STANDARD Automatic Drop Hammers
CAMPBELL #401 Cutamatic, New in '42
BODINE, RICKERT-SHAFER, GARVIN Semi-auto. & Full Auto. Tapping & Threading Machines
HIGH SPEED Hammers Nos. 1½B, 3A, 4A & 5A, M.D.
PINES ENGINEERING Tube Trimmers & Threaders
LANDIS 2" & 4" Pipe, Nipple & Bolt Threaders
PRODUCTION MACH. Tube Polishers, Centerless
SHERIDAN 37" & 44" Die Cutting Machines, M.D.

TORRINGTON 9-DIE NON-FERROUS ROD BENCH, 100 HP, M.D. BLOCK & SPOOLER

MACHINE TOOLS

BORING MILLS

BARRETT 3½" Bar—Table Type
CLEVELAND 2½" Bar—Table Type
FISHER 5" Bar Floor Type AC—DC Drive
LUCAS #43 Precision—5" Bar Table Type, M. D.
COLBURN 48" Vertical, 2 Heads, M. D.

DRILLS

BAUSH 12 Spindle Multiple Cap. 1½"
CANEDY-OTTO 4' Radial, Motor on Arm, New 1944
CINN-BICKFORD 5'11" Radial Drill M. D.
FOSDICK 3½'9" Radial Drill M.D.

PLANERS

CINCINNATI 36"x36"x6' Box Table, 3 Heads, M. D.
GRAY 24'x42"x8' Widened Pattern, 2 Heads
NILES, BEMENT, POND 72" x 72" x 20' M. D., 4 Heads
SELLERS 36"x36"x9'—4 Heads

TURRET LATHES & AUTOMATICS

LIBBY 4H—SLIDING BED, GAP 32" SWING, 12½" HOLE IN SPINDLE, 25 HP AC MOTOR, 84" SWING IN GAP, NEW '43

BROWN & SHARPE No. 1 Semi-auto. Hand Turret New '41
WARNER & SWASEY Nos. 3A, 4 & 8 Hand Turret
NEW BRITAIN & GRIDLEY Automatic—1" & 1¼"

GRINDERS

PRATT & WHITNEY 14" VERT. SURFACE, HYDRAULIC FEED MAG. CHUCK, NEW '43

CINCINNATI 14"x48" Universal Grinder, '42
HEALD #22 Rotary Surface—12" Chuck, New '43
NORTON 10"x36" Hydraulic, M. D., Perm. Chuck
HEALD No. 81 Sizematic, New '42
GARDNER Nos. 14 & 113 Twin Wheel Opposed Grinders

SHAPERS

CINCINNATI 36" Planer Type with Grind. Attach.
GOULD & EBERHARDT 16" & 20" Back Gear, M.D.
SMITH & MILLS 24" Back-Geared, M. D.

LATHES

DRAPER 27" x 16' Geared Face Plate Drive
HENDEY 14"x6' Quick Change, Taper Attachment
LE BLOND 16" x 12' G.C.G., M. D. Full Equip.
McCABE 2 Spindle 24"—46" x 14"
SIDNEY 14" x 30" 16 Speed Head, Tool-Room Lathe, Taper Attachment, Collets, Chuck, Coolant, New '43
WALCOTT 20" x 12', G.C.G., M. D.

MILLERS

BROWN & SHARPE No. 2A Universal, M. D.
GORTON 3L Pantograph, M. D.
CINCINNATI Nos. 2, 3, 4 Plain & Universal & Vertical
KEMPSMITH No. 3 Universal, Full Equip., M. D.
VAN NORMAN No. 21 Duplex, M.D.

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★

THE GOVERNMENT OF THE UNITED STATES

thru the DEFENSE MOBILIZATION BOARD and the DEFENSE PRODUCTION ADMINISTRATION—in addition to the ESA, NPA and NSRB has recognized MDNA as representing the USED MACHINERY DEALERS by confirming the importance of an inventory of all used machine tools to be assembled through the National Office of the Industry's Trade Association—MDNA.

★

STANDARDS AND ETHICS

The BOARD OF DIRECTORS of MDNA for 1950-51 is openly pledged to establish STANDARDS and affiliate the MACHINERY DEALERS NATIONAL ASSOCIATION with the AMERICAN STANDARDS ASSOCIATION. This not only emphasizes the dependability of MDNA members but indicates the intent of this segment of the Machine Tool Industry to further purposes of and expedite production for the end-user.

★

COOPERATION

MDNA, through its National Office, and its Executive Director, is presently cooperating to its fullest extent with the DEPARTMENTS OF DEFENSE and COMMERCE in Washington, D. C., and shall continue to do so.

• *MDNA stands ready to service any inquiry by manufacturers or end-users concerning USED MACHINE TOOLS.*

MACHINERY DEALERS' NATIONAL ASSOCIATION

20 North Wacker Drive **Chicago 6, Illinois**

J. M. P. FOX

Executive Director

IN STOCK

LATE TYPE MACHINE TOOLS

Hanchett No. 221 opposed Disc Grinder

10"x18" Norton Type C Plain Grinder, 1943

No. 25 Giddings & Lewis Horiz. Boring Mill—1946

1-1/16" Model A Cleveland Automatic, '43

13"x4' LeBlond Production Lathe—1942

Detroit Model DH2 Brinell Tester

No. 4FU Foster Fastermatic Chucker—1943

No. 16 LeBlond Heavy Duty Auto Lathe—1944

24"x84" Monarch Engine Lathe w/duplicator—1941

No. 2LMS Leland-Gifford 4 Spdl. Drill Hyd.—1941

No. 12 Gisholt Automatic Lathe, 1943

1H5 Libby Turret Lathe, 5¼" hole, 1941

Bridgeport Duplex Automatic Mill—1944

No. 2LMS Leland Gifford Single Spindle Drill—1942

No. 08 Cincinnati Horizontal Mill—1941

6"x72" Lees Bradner Thread Mill—1941

Fitchburg 48" Hydraulic Spline Grinder—1940

30" Ingersoll Face Mill Grinder—1940

16" Kearney & Trecker Face Mill Grinder—1942

1¼" Cone 4 Spindle Automatic—1941

Cincinnati Monoset Grinder

6"x18" Norton Plain Grinder—1941

10"x18" Landis Plain Grinder—1942

36A Hanchett Rotary Grinder—1942

No. 304 Bliss Straight Side Press—1942

12" Morey Vertical Shaper—1943

Erco Model 1002 Riveters 48" Throat—1943

Erco Model 279 Riveters 36" Throat—1943

MDNA MEMBER

DONBERG & DANITS

INDUSTRIAL EQUIPMENT

Machine Tools

228 N. Morgan St. **Chicago 7, Ill.**

TELEPHONE SEeley 8-1800

GUARANTEED EQUIPMENT

IMMEDIATE DELIVERY

BORING MILLS

Bullard 24", 36", 42" VTL. New Era
Cleveland 2½" Bar Cap.
Giddings & Lewis No. 0, 3" cap. (2)
Giddings & Lewis No. 32, 3⅛" cap.
King 42" & 72" Vert. 2 rail heads
Lucas No. 31 Precision, 3" bar
Niles-Bement-Pond 4" Bar
Niles-Bement-Pond 4½" Bar
Niles-Bement-Pond 60" Vert.

DRILLS AND RADIALS

American 6'13", 5'11"
Buffalo #2 Motor Spindle
Canedy-Otto 3'-9" cal.
Defiance #112, 21" Production type
Fosdick #5 BM, #3 taper
Natco B2 24 spindle
Sibley 24" & 28"

ENGRAVERS

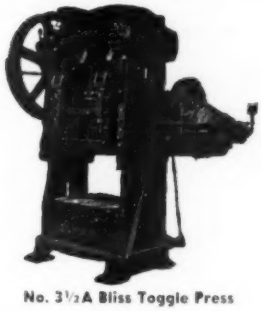
Gorton #1A 2 Dimensional
Gorton #3B 3 Dimensional

GEAR EQUIPMENT

Barber-Colman #12 Hobber (2)
Brown & Sharpe #13 Cutter
Fellows High Speed Shapers #7, 712, 72, 725
Flather 72" Cutter
Gleason 3" Straight Bevel Generator
Gleason 11" Bevel
Gleason #4 Angular Bevel Tester
Gleason #2 Surface Hardener
Gould & Eberhardt 36" Cutter, Univ.
National Broach Red Ring Lapper
Schuchardt & Schutte #1 Hobber

GRINDERS, MISCELLANEOUS

Brown & Sharpe #5 cyl.
Brown & Sharpe #1, #3 Univ. #13 Tool
Cincinnati #2 Centerless
Cinn. 12 x 48" Univ., Gardner #226, 30" disc
Covel #91A Univ. Tool & Cutter, Hammond #4
Heald 72A3 Int. Centerless Sizematic, #1 Tool
Landis 10" x 24" Univ., Latest, #6 Thread
Landis 6" x 30" Type C Cyl.
Norton #2 Tool & Cutter 6"x18", 6x30" Type C cyl.
Oliver #510 Drill Pointer, Sellers 4G, Black Diamond
Porter Cable Belt WGB, G8; Gronby Int.
Pratt & Whitney Radius #R6, K.O. Lee Tool



No. 3½A Bliss Toggle Press

GRINDERS, SURFACE

Abrasive 8 x 24", #33, #34 Vert., 3B
Blanchard #16, 30" Mag. Chuck, #11—16" chuck
G & L #25, 6" x 18"; #45, 12" x 24" Hyd. Feed
Heald 22—12" chuck, Arter 12"
Norton 6 x 18" Hyd., 10 x 36"
Pratt & Whitney 12 x 36" Vert.
Reid #2A P.F. Motor in Base
Thompson Hyd. 6 x 10 x 18", 6 x 12 x 18"

LATHES

American 20" x 8' Bed G.H. Lathe
#2A Duomatic, Like New
Fay Automatic 12" x 81"
Hardinge Precision 9", 1" Collet Cap., Rivett
Hendey 12 x 30" T.A., collets, etc.
Hendey 14" Yoke Head Lathes
LeBlond Regal 10" x 3' bed
Lodge & Shipley 20" x 54"
Lodge & Shipley 14" x 30"
Putnam 36" x 22'
Putnam 42" x 17'
Sebastian 12" x 4' G.H.
South Bend, 10 x 4
Wickes 32" x 35' Geared Head

MILLS, PLAIN, UNIVERSAL & PROD.

Brown & Sharpe #000, 12, 21, #2A Univ.
Burke #4 Plain & Univ. Vert. Hd.
Cinn. 08 PL & Vert.—Risc & Fall
Cincinnati 1-18, 2-18 Mfg., #2M Plain, 1M Univ.
Cincinnati #4, Univ. High Power
Kent Owens IV
Sundstrand 000 Rigidmil; Whitney Hand Mills
U. S. Multimills, MMI, Duplex

MILLS, VERTICAL

Cincinnati #4, 08 Vert.
Gorton, 8½D Duplicator
Morey #12M Profiler, 2 sp.
Pratt & Whitney #2 Jig Borer

PRESSES

Bliss 650 HI-Production Presses
Bliss 20, OBI, 58, 62, 162 OB
Bliss 4½ Double Action, Roll Feeds
Bliss #78½, 330 Ton
Bliss 3½A Double Action Toggle

HYDRAULIC EQUIPMENT

SELF CONTAINED PRESSES

500 Ton Lake Erie, 35" x 36" Platen 36" stroked opening
500 Ton Shatt Straightener 24' Long Bed. Watson Stillman
125 Ton Southwark Press, Bed 96" x 30". 30" stroke, 2 to 4 ft. opening
50 Ton Burroughs 8" stroke 18" x 17" Platen, 18" opening
80 Ton Wilson Press, 51"x24" Platen, 11½" St. 13" opening
50 Ton Hannifin, 20' St. 30 x 22 Bed—24" opening
35 Ton Oil Gear Straightener
50 Ton Stokes Molding Press

MISCELLANEOUS PRESSES

550 Ton Southwark, 42" x 32" Platen 28" St. 48" opening
300 Ton Watson Stillman 24 x 20" Platen 11" St. 21" opening

All Hydraulic Equipment is completely engineered and checked by a competent staff, thus assuring reliability. Send us your Hydraulic problems.

NEW IN STOCK

Air Hydraulic Presses—Arbor Presses #6C Famco—Band Saws Kalamazoo—Drill Presses all sizes—Hydraulic Press Northern 20 Ton—Injection Molders, 1 ounce—Power Presses, OBI, 1, 4½, 5, 7½, 10, 15, 20, 30 ton—Shaper, 7" Amco, 8" Shaperite—Shaper, Sheldon 12"—Shears, Foot 22" to 8', 16 & 18 ga.—Shears, Power, 3'x18 gauge to 10'x 10 ga.—Welders, Arc, Seam, Spot all sizes—Vert. Milling Attach. Halco H.S.—Motors, Grinders, Buffers, all sizes, etc.

Ferracute EG54, 400 Ton Knuckle
Henry & Wright 100 Ton, 1943, Feeds
Niagara A1¾, O.B.I.
Toledo 400 Ton Knuckle Joint #663
Toledo 29 Double Action Cam
V. & O. #102 O.B.I. Reducing

TURRET LATHES

Acme 6W Fox
Brown & Sharpe, #1, 2F, Hand
Gisholt #4, 2L, Foster #3B
Oster #601 Rapiduction, well tooled
Warner & Swasey #2A
Warner & Swasey #1A
Warner & Swasey #6

MISCELLANEOUS

Automatic 4 Sp. 1½" Cone
Band Saw: Tannewitz #36M, Marvel #8
Filers—Do All Band Filer
Filers—Grob Band Filer
Hacksaw: Marvel 6A Automatic #6, #9, Peerless
Honer: Micromatic #H-1
Keyseater: Davis, Baker, M & M
Preheaters—for Plastic Moulding—New & Used
Riveters: HI Speed
Seam Welders—Ammunition Box, Taylor-Winfield—New
Shaper—24" Cinn. Univ. Like new
Shaper—Gould & Eberhardt 16", 26"
Shaper—American 24"
Shaper—Queen City 24"
Shaper—Potter & Johnston 24"
Shapers—8" Shaperite
Tablet Machines—Stokes
Tablet Machines—Colton
Tappers: Bekewell #1, #2; Haskins 30
Welders, Seam & Spot: Thompson, Taylor-Winfield

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5" Sander Pipe Machine
Bullard 28" Vertical Mills
⅝"x10' Power Rolls
24" Smith Mills Shaper, MD
Whitcomb Planer 24"x24"x6'
#3 Warner & Swasey Turret Lathe
6" Reed Prentice Small Piece Lathe
#2 Brown & Sharpe 1" cap. Automatic
10"x10" Power Hack Saws
11 Foot B&S Vernier Gauge

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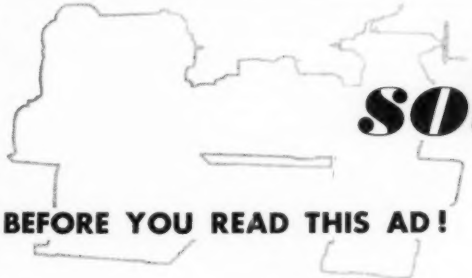

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to find the machines you need—
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LATHES

MONARCH 20"x72" centers Model "M", 16 Spd. Gr. Hd. 22½" swing, Monarch auto. sizing controls (late)

PRATT & WHITNEY Model "B" 16"x36" motor-in-base

PRATT & WHITNEY 16"x54" ctrs. Model "C" (late type)

MONARCH 24"x162" ctrs. M.D. Engine Lathe—actual swing 26"

NILES-BEMENT-POND 48" x 30' centers — quick change gr.—gr. hd. heavy duty AC motor drive—2 carriages—taper attachment—power rpd. traverse—16 spds. 2.04 to 90 RPM—late type

AMERICAN 18"x8' 12-Speed G.H., swing 20½"—centers 50½"

TURRET LATHES

2—FOSTER #5U Turret Lathes (late type) with chucks & tooling—hole thru spindle 3⅝"—hardened steel ways

2—WARNER & SWASEY #1, 5⅝"x4", Electric Turret Lathes (late type) with 1/3 HP motor for power automatic chuck bar feed—4-speed spindle motor

GRINDERS

BROWN & SHARPE #4, 10"x60" Univ. Grinder, M.D. complete attachments.

BROWN & SHARPE #5, 3"x18" Plain Grinder, M.D. with sizing attachments—(1944 vintage)

BLANCHARD #10 High Power Rotary Surface with 16" chuck, capacity 18" dia. (excellent condition)—10 HP Spindle motor

TOOL AND CUTTER GRINDERS

NORTON #2 Universal Hydr. Tool & Cutter, 1945 machine, complete with M.D. Universal workhead and attachments

NORTON #1 Tool & Cutter Grinder (late type), with workhead and footstock,—attachments (1941 vintage)

DRILLS

CINCINNATI-BICKFORD 24" and 28" "Super-Service" Upright Drills (late type)—#4 Morse taper—with tapping attachments—1000 RPM—coolant

AVEY 2-Spindle M.D. #2 Power Feed Drill #2 taper.

3—RUESCH Two-High Water Cooled Rolling Mills, 8" face, 5" dia. rolls, and one that is not water cooled—complete with one extra set of water cooled rolls and one extra set plain rolls—M.D.—complete with coiling devices—originally used for reducing nickel stock from .040 to .007 thickness—herringbone drive

PLANERS

CINCINNATI 30"x30"x8' Hypro Planer M.D.—one rail and one side head

NILES 1½"x24 foot capacity plate Planer M.D., pneumatic holddowns

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3 SHERMAN ST. WORCESTER 1, MASS.

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BORING MILL—4" Bar Giddings & Lewis Floor Type, M.D.

HOBBER—No. 130 Cleveland, 8" Cap. (Prac. New)

EMBOSSING PRESS—Krause—26"x19" Bed

PLATE PLANER—30'x1" Cleveland

ROLL LATHE—26" United Engr. Co., Enclosed Geared Head. M.D., 9'3" Centers

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#32 Giddings & Lewis Table Type
3½" Cincinnati Gilbert Floor Type
Three—#DB102 Excello Double End Boring Machines
#420 W. F. & J. Barnes Two-Spindle Deep Hole Driller and Borer—1942
Webster Tallmadge Single Spindle Gun Barrel Driller and Borer—1942

DRILLS

#262 Barnes Sliding Head Single Spindle
24" Cincinnati Super Service Single Spindle —1942
#2M Leland Gifford Four Spindle
#300 Hanchett Hydraulic Vertical Surface
#900-SS Hanchett Hydraulic Face—1942
Model TG-615 Jones & Lamson Automatic Thread—1942
#87 Wickman High Precision Profile

NUT & BOLT MACHINERY

#00 Waterbury Farrel SSSD Header
#0 and #1 Waterbury Farrel Screw Slotter
¼" National Precision Nut Tapper
#2 Waterbury Farrel Automatic Nut Tapper
⅝" Type "K" Economy Pointer & Shaver
#10 Waterbury Farrel Horizontal Hopper Feed Thread Roller

PLANERS

48"x48"x16' Cincinnati Hypro Double Housing —1941
120"x96"x20' Cincinnati Double Housing

PRESSES

#6A Thomas Open Back Inclinable—1946
75 Ton Henry & Wright Dieing
#1 Waterbury Farrel Four Post High Speed
#8K Cleveland Knuckle Joint Embossing—1943
350 Ton Lake Erie Vertical Hydraulic—1945

SCREW MACHINES

Two—#4 Brown & Sharpe Single Spindle

Every reconditioned machine tested under power

GRINDERS

#24-LW-36" Bryant Internal Chucking—1943
6"x18" Cincinnati Model ER Plain Hydraulic
6"x18" Norton Model C Plain Hydraulic—1942
6"x30" Norton Model C Plain Hydraulic
10"x18" Norton Model C Plain Hydraulic—1942
10"x36" Cincinnati Type EA Plain Hydraulic —1939
14"x48" Cincinnati Type EA Plain Hydraulic —1942
8"—#20 Heald Rotary Surface
Model G-1 Doall Hydraulic Surface—1943
14" Pratt & Whitney Hydraulic Vertical Surface—1945

LATHES

14"x6' Hendey Model EBM Geared Head
#3 Hendey Hi-Speed Step Turning
#10 Sundstrand Automatic Stub
Lipe Carbo Semi-Automatic—1943
42"x108" Niles Heavy Duty Geared Head—1943

MILLERS

#08 Cincinnati Plain—1940
#3 Kempsmith Plain
#5 Cincinnati High Power Plain—1942
#08 Cincinnati Vertical—1941
#2A Brown & Sharpe
#34—36" Cincinnati Plain Hydromatic—tracer —1942
#56—96 Cincinnati Plain Hydromatic—1940

TURRET LATHES

#3 Gisholt Universal Geared Head—1941
#H-5 Libby Heavy Duty Geared Head—1941
#1A Warner & Swasey Universal Geared Head

MISCELLANEOUS

#602 Wallace Hydraulic Rotary Type Bender —1944
#3 LeBlond Rifling Machine—1941
W. F. & John Barnes Horizontal Hone—1942
#12 Bertsch Seven Roll Plate Straightening Roll—1942
#4B Nazel Forging Hammer—1941

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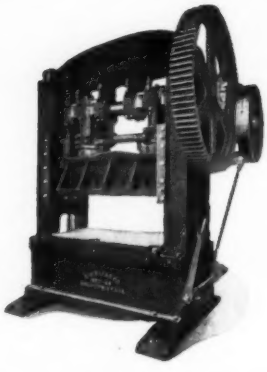

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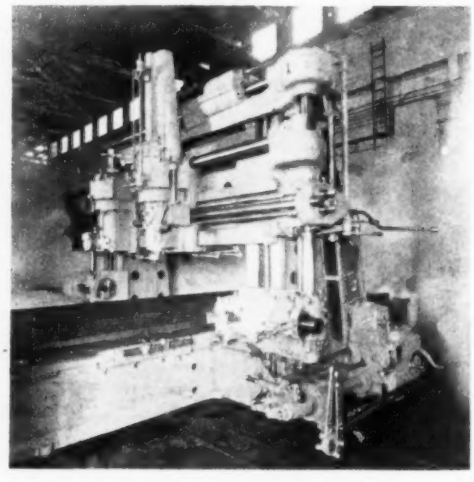

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#4 CINCINNATI Vert. Milling Machine ... 1150
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42" x 16 ga NIAGARA Power Shear, underdrive ... 575
3G LITTELL Winder Reels (6) ... ea 175
12"x35" SEBASTIAN Geared Head Lathes (3) ... ea. 1275
WATERBURY FARRELL Bullet Presses, 20 ton, 9" stroke. (2) ... ea 1150
#2 CINCINNATI ACME Univ. Turret Lathe 1150
K-5 WARDWELL Auto. Bandsaw Filer & Setter ... 175
HC WARDWELL Auto. Band & Hacksaw Grinder ... 375
30" ROGERS Vertical Turret Lathe ... 1150
50 ton WILLIAMS AND WHITE Vert. Hyd. Press, 4 post ... 6250
DB-112C EXCELLO Boring Machine ... 4950
#16 BLANCHARD Rotary Surface Grinder ... 4150
J & L HARTNESS Turret Lathe, shucker ... 500
150 Amp. GENERAL ELECTRIC Arc Welder, MG, port. ... 225
400 Amp. WILSOM HORNET Arc Welder, MG, port. ... 295
#2BG GARVIN Automatic Tapper ... 195
#1 GARVIN Automatic Tapper ... 150
12B PRATT & WHITNEY Vert. Miller & Profiler, 2 spdl
50 KVA TAYLOR & WINFIELD Special Horiz Seam 105MM Shell Welder (3)

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12"x48" SHELDON Lathe, pedestal base
11"x30" SHELDON Lathe, metal cabinet base
#55G JOHNSON OBI Punch Press, 50 ton, 6" stroke
#3 JOHNSON OBI Punch Press, 27 ton, 4" stroke
#18D BUFFALO Drill Press, floor type, #3MT.
#15 BUFFALO Drill Press, floor type, #2MT.
NB-18 GROB Metal Profile Band Saw, 18" throat
30 KVA REX Spot Welder, air operated, press type
15 KVA REX Spot Welder, foot operated, rocker arm type
#J JOHNSON Metal Cutoff Band Saw, 10"x18" cap.
12 ton WIANT Hydraulic Arbor Press

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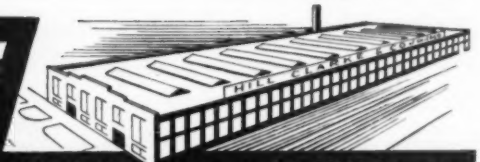

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AUTOMATICS
No. 49 New Britain, 4 Spdl. Chucker

DRILLS
1, 2, 3, 4, 5, 6 Spdls Leland-Gifl., Allen, Edlund, Aveys
3'-11" Cincinnati Gilbert Radial (1942)
No. 112 Defiance

GEAR MACHINES
No. 61-A Fellows Gear Shaper (1942)
No. 615A Fellows Gear Shaper (1942)
No. 71-A Fellows Gear Shaper (1942)
No. 72 Fellows Gear Shaper
11" Gleason Bevel Gear Generator
No. 12 Gleason Bevel Gear Generator
No. 13 Brown & Sharpe Spur & Bevel
No. 1 Whiton Auto. Gear Cutter
6" Gleason Bevel Gear Tester (1942)

BORING MACHINES
No. 31 Lucas 3" bar, M.D.
3" Bar Universal Horizontal Boring
Rockford—3½" Bar
No. 2 Lambert 4" bar
No. 46-B Heald Bore-Matic (1942)
No. DB-112 Excello—Single End—2 Hds.
24" Bullard New Era
42" Bullard New Era
42" King
60" Colburn, M.D.
72" Niles-Bement-Pond

GRINDERS
3"x12" Brown & Sharpe No. 5 (1944)
4"x12" & 4"x18" Landis, Model H (1942)
6"x18" & 6"x30" Norton Type C Plain (1943)
10"-14"x36" Norton Type C Plain (1942)
10"x18" Norton Type C Plain (1943)
10"x48" Norton Type C Plain (1943)
10"x72" Landis Type C Hydraulic
Norton Motorized Grinders ranging from 6"x18" to 24"x144"
No. 104 Rivett Univ. Gdr. (1943)
No. 5 Bryant Internal Grinder
No. 34 Abrasive Surface Grinder (1943)
No. 22—12" Heald Surf. Gdr.
No. 25-A Heald Surface Grinder
No. 72-A-3 Heald Internal (1942)
No. 72-A-5 Heald Internal (1942)
No. 72-A-5 Heald Extended Bridge Internal
No. 24-26 Bryant Internal Gdr.
No. 81 Heald Centerless Internal

LATHES
18"x6' American, Gdr. Head, M.D.
17"x8' LeBlond, Cone Hd., M.D.
18"x8' American Gd. Hd.
24"-27"x22' Lodge & Shipley
36"x16" Betts—Bridgeford Grd. Head
10"x22" Sundstrand, Model AA (1943)
20" Fay Automatics (1942)
Model R-14 Seneca Falls Lo-Swing
No. 4R Libby (1942)
18" Libby, M.D.
No. 3-A Warner & Swasey, Bar

MILLING MACHINES
No. 3B Milwaukee Plain
No. 3 Cincinnati H.P. Universal
No. 4 Cincinnati H.P. Plain
No. 6B Cincinnati Vert.
No. 2½-B Milwaukee Vert.
No. 2 Cincinnati Dial Type Vertical (1941)
No. 3 Cincinnati H.P. Vertical
No. 1-18 Cincinnati Mfg. (1942)
No. 3—18" Sundstrand-Electromil (1942)
No. 2—24" Sundstrand Electromil (1942)
No. 4-48 Cincinnati Hyd. Tracer (1942)
No. 45-48 Cin. Hyd. Tracer (1941)
6"x36" Lees-Bradner—Model LT (1943)
12"x54" H.T. Lees-Bradner Thread Miller (1943)
10"x48" Hanson-Whitney Thread (1942)
48"x24"x12' Ingersoll Slab Miller, 4 Hds.
36"x24"x12' Ingersoll Duplex Miller (1946)
36"x36"x12' Ingersoll, 3 Heads

MISCELLANEOUS
36" Ohio Shaper
18" Dill Slotter
No. 8 Armstrong Band Saw
18" Newton Slotter
10"x10" Rasesmussen Saw, Stock Fd.
4" Toledo Pipe Machine (1944)
No. 0 Bakewell Tapper
Baush Radial Tapper
Micromatic Vertical & Horizontal Hydrohoners

PLANERS
36"x36"x12' Cincinnati
36"x36"x12' Gray, 2 Hds.
48"x36"x14' Gray
48"x48"x12' Cincinnati, 4 Heads

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651 WASHINGTON BOULEVARD, CHICAGO 6, ILL. PHONE CEntral 6-0500

UNUSUAL VALUES

Milling Machines—No. 1 Universal. No. 1 American (new) plain, No. 1 Vertical.

Drills—Large selection, single and multiple spindles also bench types, many of them new.

Gear Cutters—Brown & Sharpe No. 3—26" Gould & Eberhardt 42".

Grinders—Cylindrical B & S No. 11, Planer type 16"x36" Surface 12"x63", also new (small) Universal bench and floor type. All with coolant, motorized.

Lathes—14"x6', 8', 10'—10"x6', 3', 10'—18"x6', 8' 10'—26"x16'—all cone drive, several motorized also (new) 18"x8' and 10' geared head, motorized. Large stock 19" and 18" bench and floor type.

Planers—Single head 24"x6', 24"x8', 26"x8'.

Shapers—16", 20", 24" B.G. crank.

Turret Lathes—J & L 2"x24"—3"x36" also Acme, W & S Turret (vertical) boring and facing mills, 5 hole turrets, 30", 40".

SPECIAL—New totally enclosed dust proof, fan cooled ball bearing saw arbor motors, plain shafts to size or threaded, and with collars, measures only 3¼" from center of shaft to flatted top (1 h.p. to 15 h.p.) 2 or 3 phase, 3600 r.p.m.

WOOD WORKING MACHINERY—A very large stock of new and re-built, practically all motorized. New Motorized overhead cut-off and miter saw for wood, plastics, steel, aluminum and other metals. The above list is only a fraction of our stock which changes almost daily, therefore, tell us definitely what you want since we are adding considerable number of machines to our stock which are too many to list. What we have today may be sold tomorrow, so a list is really not dependable.

Drill—Foote-Burt No. 25 24" Hi Duty 2" capacity in steel. Motor attached.

PATTERN MAKING MACHINERY—42"x16' bed wood lathe, compound rest, rack and pinion feed to carriage; 16" heavy duty joiner, extra long bed, front table tilts for giving draft to pattern work; tilting table also tilting arbor rip and cut-off saws; band saws; jointer; floor and bench type trimmers; and also many other machines for pattern work.

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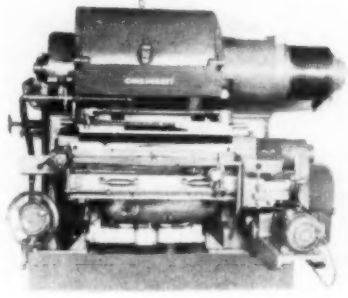
NO. 6 CINCINNATI CENTERLESS GRINDER

UNUSED SINCE HAVING BEEN FACTORY REBUILT IN 1948

FOR SALE OR LEASE



Work capacity approx. 12 inch diameter

Single or Multiple Grinding Wheel capacity up to 36" diameter by 36" wide

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Profile Hydraulic truing for each grinding and regulating wheel

50 HP drive to Grinding wheel

Will grind various diameters at one setting by use of multiple grinding wheel arrangement

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1⅞" CONE 8-SPINDLE AUTOMATIC 1943, FIRST CLASS CONDITION

CONE CENTER DRIVE DOUBLE END AUTOMATICS (2)

No. 4-B Edlund Single Spindle Drill, No. 3 M.T. Late

NO. 1-A FARRELL-SYKES HERRINGBONE GEAR GENERATOR

NO. 6 GLEASON REVACYCLE BEVEL GEAR GENERATOR, LATE TYPE

NO. 13 GLEASON UNIVERSAL GEAR TESTERS, VERY LATE, AC MD (2)

No. 70-A Heald, No. 81 Heald, & Sav-Way Internal Grinders

Nos. 32 and 35 Van Norman Radius Grinders

30" x 50" Brown & Sharpe Universal Grinder, Late Type

No. 4 Brown & Sharpe Universal Grinder, Factory Motor Drive

24" x 10' American 12-speed GH Lathe, Taper Attachment

Nos. 2 & 3 Cincinnati Universal Mills, High Power Type, M.D.

No. 4 Cincinnati High Power Vertical Mill, Timken Bearing

No. 8-P Cleveland Horning Press, Late Type

24" GEMCO UNIVERSAL SHAPER, LATE, FIRST CLASS CONDITION

24" Gould & Eberhardt "Invincible" Shaper, Motor Drive

6" Pratt & Whitney Model B Vertical Shaper, Motor in Base

No. 30 Precision Holmes Tilted Tapper, Motor Drive

10" x 60" PRATT & WHITNEY THREAD MILL, ALL EQUIPMENT. LATE TYPE

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LATHES

14" x 6' Lodge & Shipley Tool Room, TA Late Type.

Acme Denver Turret Lathe, 7¼" hole, air collet att.

No. 5 Foster Univ. Turret Lathe, Bar Feed. 1942 Machine.

12" x 6' LeBlond, Late Type.

Seneca Falls, Lo-Swing, type LR.

20" x 6' American, T.A., G.H.

18" x 10' Greaves-Klusman, T.A., G.H.

14" Hendey, Yoke Head.

16" x 6' Aerican, Cone Head, Motorized.

1A Warner & Swasey, preselector, T.A., thread att.

2—Simmons #2 Micro-Speed Turret Lathes.

2—Foster #5 Universal Turret Lathes, bar feed.

10" South Bend, 1" collet cap., Turret.

GRINDERS

12" x 36" Norton Multi-Purpose Grinder, Ext. and Int.

No. 72A5 Heald Internal Extended Base Grinder.

No. 3 G & L Univ. Tool & Cutter Grinder.

No. 2 Cincinnati, Centerless, Filmatic, fully eqpt.

No. 2 Brown & Sharpe, Surface, m.i.b., p.f.

No. 1 Brown & Sharpe, Universal, Int. Att. Late Type.

MILLS

No. 3B Brown & Sharpe Plain Miller, Late Type.

No. 2L B & S Vert. Mill, Late Type.

1B Milwaukee Universal Mill.

Universal No. 14 Cochran-Bly Miller & Slotter, with Universal Head.

U.S. Multi-Miller Double Spindle.

No. 000 B & S Production, Late Type.

Becker #4 Horiz. Mill, m.d., good cond.

PUNCH PRESSES

Bliss No. 22 Horning Press, Motor Driven.

Ferracute O B I DG4, Double Action, 50 ton cap., Scrap Cutter, Feed Rolls, Stroke 2-3".

Whitney-Jensen #130 deep throat Press.

MISCELLANEOUS

4' 15" Cincinnati Bickford Radial Drill, Motor on Arm.

G & E 28" Shaper M.D.

24" Columbia Shaper.

17" Smith & Mills Shaper.

16" Gould & Eberhardt Shaper, Factory Motor Drive.

7A Fellows High Speed Gear Shaper.

42" Tannewitz Metal Cutting Band Saw.

Detroit Model MTM27 Motor Driven Tapping Machine, Cap. 2", 12 NS Mild Steel, new 1945.

2 Federal 75 VA Spot Welders, Press Type, Air Operated, Ignitron Controls. Aluminum Type.

Federal 60 KVA Spot Welder, Rocker Arm Type, Motor Driven, Ignitron Controls. Aluminum Type.

16" Potter & Johnson Shaper, Univ. Table, p.f. head.

Many others available for immediate delivery

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8" 6-spindle Bullard, M. D.

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60" Colburn
62" Niles-Bement-Pond
72" Bickford
All equipped with 2 swivel heads; Power Rapid Traverse; M. D.

GRINDER

25A Heald Rotary; 16" chuck; M. D.

GEAR HOBBER

#8—10" Hercules; M. D.

LATHES

16" x 8' American and Monarch; M.D.

MILLERS

#3 Cincinnati Plain Rectangular Overarm; M. D.
#4 Cincinnati Plain; M. D.

THREAD MILLERS

6" x 14" and 10" x 60" Pratt & Whitney; M. D.

SHAPER

24" Gould & Eberhardt; M. D.

VERTICAL SHAPER

10" Pratt & Whitney; M. D.

SUN MACHINERY COMPANY
36 Van Vechten St., Newark 5, N. J.

QUALITY MACHINES

Bolt Threader, 1½" Landmaco SH, LS, MD. (1947)
Cut-Off, #302 Campbell Hyd. Abrasive, MD. '41.
Grinder, Rotary, #25A, 16" Heald Hyd., MD. (1943)
Miller, 0-8 Cin. Auto. Horizontal, MD. (1942)
Miller 3-36 Cin. Plain Hydromatic, MD. 2 cycle
Nibbling Machines, 208 & 312, Turret Hd, MD.
Nipple Machine, 1½" Landmaco, SH., MD. (1945)
Shaper, 36" Cin. Universal PDF., MD. (1947)
Stenciling & Knurling Machines, #3. (1943)
Transmission, #6¾B. Reeves 30 HP. (1945)
Turret Lathe, 3F. Fastermatic, Auto. Hyd., MD.

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5 Ton 47' Span
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32" Ohio Dreadnaught Shaper, Vee Ram, Serial N. 4M-29-55. Mfg. 1947.

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FOR SALE—Metal clean rotary spray washer, length 5', width 4', height 7'10", capacity 180 gal. with spray supply pump, 125 GPM at 40' head, 2" suction, 2" discharge. Washer equipped with 40 spray nozzles. Fully equipped with electrical equipment. J. F. MEYER, STEWART-WARNER CORPORATION, 1826 Diversey Parkway, Chicago 14, Ill.

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PRESS, 100 Ton Hydraulic 30"x30"x18"
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NORMAN HOUSER *Machinery Dealer*
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SCREW MACHINES

No. 1 Brown & Sharpe, Hand
No. 2 Brown & Sharpe, Hand (2)
No. 2 Warner & Swasey Electric, serial 580374
No. 4 Warner & Swasey G.H. Univ., serial 338359
No. 4 Warner & Swasey G.F.H. Universal Turret Lathes (4)
No. 5 Bardons & Oliver Turret Lathe, serial 14063
No. 6 Warner & Swasey G.F.H. Turret Lathe, serial 286187
No. 7U Foster G.H. Universal Turret Lathes, 1938 (2)
No. 1A Warner & Swasey Turret Lathe, serial 345019
No. 1L Gisholt Turret Lathe, serial 612-3
No. 2L Gisholt Turret Lathe (Chucker), late
No. 2A Warner & Swasey G.H. Univ., serial 199504
No. 12 Gisholt Hydraulic Aut. Turret Lathes, late (2)
No. 00, No. 0 and No. 2 Brown & Sharpe Automatics (10)
No. 00 Brown & Sharpe Turret Formers, roller bearing (4)
No. 00G Brown & Sharpe Automatics, serials 11208, 10314, 7132
No. 0 Brown & Sharpe H.S. Automatics, serials 8093 and 8090
No. 0G Brown & Sharpe H.S. Automatic, serial 11523
No. 2G Brown & Sharpe H.S. Automatic, serial 9015
No. 2G Brown & Sharpe Automatic, serial 4347
No. 2 Wickman Swiss Type Automatic, late
9/16" Model DA2 Davenport Automatics (2)
9/16" Model C Acme Automatic
⅞" Model A Cleveland Automatic
1" Model C Acme Automatic
1⅝" Foote-Burt Automatic (1941)
3¾" Model A Cleveland Automatic, serial 30484
No. 454 New Britain Automatic Chucker
8½"x8" Goss & deLeeuw Chucker

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TELEPHONE TAylor 9-8200
LAKE MACHINERY COMPANY
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"CLINTON OFFER FROM STOCK"

ENGINE LATHES
16"x54" Monarch Model CW, Taper Att.
12"x30" American Geared Head. Taper Att.
16"x6' Hendey Geared Head, Taper Att.
24"x10' Hendey Geared Head, Taper Att.

MILLING MACHINES
#2H Milwaukee (Kearney & Trecker) Plain Mill.
#2H Milwaukee (Kearney & Trecker) Vertical Mill.
#2 Milwaukee Standard Plain Mill.
#3 Milwaukee Standard Plain Mill.
#3 Brown & Sharpe Standard Plain Mill.
#5 Cincinnati Timken Bearing Plain Mill.

BORING MILLS
24" Bullard Vertical Boring Mill. Spiral Drive.
60" Niles Bement Pond Vertical Boring Mill.
#32 Lucas Hor. Boring Bar. Rebuilt.

SHAPERS & PLANERS
16" Steptoe Tool Room Shaper Built 1948.
20" Gemco Shaper Late Type.
20" Gould & Eberhardt Motor Drive.
28" Gould & Eberhardt Motor Drive.
24"x24"x8' Gray Planer, Motor Drive.
30"x30"x8' Cleveland Open Side, Motor Drive.

GRINDERS
#25A Heald Rotary Surface Grinder.
12"x36" Cincinnati Universal Grinder Built 1937.
#104 Rivett Internal Grinder Built 1942.

RADIAL DRILL
1-4'x12" Col. Triple Purpose American Radial.

CLINTON MACHINERY CO.
400 S. CLINTON STREET
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LATE MODEL MACHINE TOOLS . .

AUTOMATICS
No. 49 New Britain Chucker, 1941.
20"x25" Fay Automatic, 1942.
9/16" A Cleveland, 1943.

BORING MACHINES
No. 49 Heald Single End. 1942.

DRILLS
No. 26 HO Baker Hyd. 1942.
No. 2 LMS Leland Gifford Hyd. 1942.

GEAR EQUIPMENT
No. 64SA3 & 81A Fellows Gear Shaper. 1943.
No. 72 Fellows Gear Shaper. 1943.
No. 6 Gleason Revacycle. 1940.
No. 6 Gleason Testers. 1942.
6" Red Ring Internal Shaver. 1942.
Red Ring Universal Tester. 1942.

GRINDERS, CYLINDRICAL
16"x36" Cincinnati Plain H.D. 1942.
12"x30" Landis Universal. 1942.
10"x18" Norton Plain. 1942.
6"x18" No. 10 Brown & Sharpe Plain. 1943.

GRINDERS, SURFACE
10"x24"x192" Mattison Hyd. 1943.
14"x36" Pratt & Whitney Vert. 1943.
8"x24" Thompson Hyd. 1942.

GRINDERS, INTERNAL
No. 24-36 Bryant Hyd. 1943.
No. 172 Heald Hyd. Gap. 1940.
No. 72A3 & A5 Heald Hyd. 1943.
No. 73 Heald Airplane Cyl. 1942.

GRINDERS, THREAD
No. 35A Excello. 1943.
No. 39A Excello Int. 1942.
No. TG 615 Jones & Lamson. 1942.

LATHES, ENGINE
36"x390" American M.D.
16"x54" Reed Prentice. 1942.

LATHES, PRODUCTION
No. 3FV Vester "Fastermatic". 1942.
No. 3A Lodge & Shipley "Duomatic". 1943.
8"x108" Lo-Swing Semi-Auto. 1942.
No. 4D Potter & Johnson. 1941.

LATHES, TURRET
8½"x24" Acme Univ. 1943.
No. 5.0 Acme Univ. 1942.
No. 1M-5 Libby Univ. 1942.
No. 6R Denver Univ. 1942.
No. 3 Bardons & Oliver. 1940.
No. 2 Warner & Swasey S.P.

MILLS, PRODUCTION
No. 34-36 Cincinnati Hydro. 1942.
No. 1-18 & 2-24 Cincinnati. 1942.
No. 1-14 Kent Owens Hyd. 1942.
No. 08 Plain & R & F Cinn. 1941.
No. 2 Sundstrand "Electromil". Late.

MILLS, THREAD
6"x36" LT Lees Bradner. 1942.

MILLS, UNIVERSAL
No. 3 Cincinnati D.T. 1945.

MISCELLANEOUS
2½" Etna Hyd. Cut-Off. 1944.
48"x½" Niles Plate Straightener.
No. 616 Cleveland Rigidturner. 1942.

PRESSES
300 Ton Lake Erie Hyd. 1945.
50 Ton Denison Straightening. 1942.

SHAPERS
24" Rockford H.D. Hyd. Latest.
6" Pratt & Whitney Vertical. 1942.

WELDERS
150 KVA Federal Seam. 1943.
100 KVA Taylor-Winfield Seam. 1943.
60 KVA Sciaky Spot. Like New.

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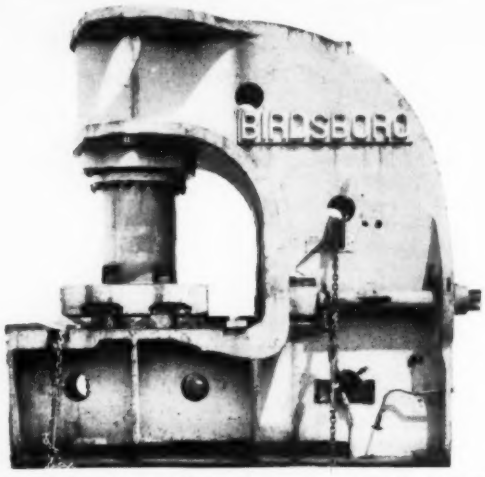

BIRDSBORO Horizontal & Vertical Joggling Press, Serial No. 1643. 350 ton, 24" stroke on Vertical Ram. 150 ton, 24 ' stroke on Horizontal Ram. Vertical Daylight 32". Distance from Vertical Centerline to Face of Horizontal ram 30". Table Area 66"x68".

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BOREMATIC, EX-CELL-O #54 Two Way, S/N 54080
ROTO-MATIC, DAVIS THOMPSON S/N 503 12", 12 spdl.
DRILL, 3 Spdl. KINGSBURY HORIZ., #18, 14 & 30 Heads
GEAR LAPPERS, RED RING NATIONAL BROACH 14 & 18"
GEAR CHECKER, ILLINOIS Space & Pitch, #W-337
GEAR BURNISHER, FELLOW #4B, S/N 20447, 4" cap.
GEAR GRINDER, FITCHBURG 20" S/N 2194 automatic
GEAR GRINDER, DETROIT Type GG30F, 16" internal
UNIVERSAL GRINDER, B & S #4 S/N 1439 Semi-Auto.
GRINDERS, INTERNAL CHUCKING Two #16 Bryants
GRINDER, SPLINE & BROACH 96" THOMPSON, S/N E-2130
GRINDER, CINCINNATI MONOSET, S/N 2-DIC-1M-14
HONES, BARNES #172 Vertical 2" bore, 6" stroke
LATHE, LeBLOND RAPID PRODUCTION, 13" S/N 683
LATHE, MONARCH 20"x48" 16 speed Geared Head
LATHE, TURRET, GISHOLT 1L, S/N 627-32, no saddle
LATHE, TURRET, GISHOLT 1L, S/N 610-17, bar feed
MILL, U.S. MM-1-5-2 Multi Miller, Rise & Fall
MILL, CINCINNATI 0-8 Verticals
MILL, K & T #3 Std. Mfg. Vertical, Rotary table
SAW, ABRASIVE CUT-OFF, RADIAC AND DELTA
WELDER, WESTINGHOUSE 300 Amp Transformer types
WELDER, WESTINGHOUSE 625 Amp Transformer type
WELDER, FEDERAL 50 KVA Butt, S/N 7567, Type F-2

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HYDRAULIC UNIVERSAL GRINDER

One (1) used Hydraulic Universal Grinder manufactured by the Cincinnati Grinder Company; 12"x48", with integral coolant system; condition excellent; operates grinding shafts, rolls, etc. to maximum 12" diameter 48" long, for internal, face and taper grinding.

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5 KW "Scientific Electric" Dielectric Heating Unit, Model SP-5, Serial 1045, 20-30 Megacycles complete with timing equipment, etc. Electrodes—6"x9", Input—220 Volts, 60 cycle single phase $900.00

6 KW "Scientific Electric" Dielectric Heating Unit, Model SE-68, Serial 1376, 20-30 Megacycles complete with tubes, timing equipment, etc. Electrodes—6½"x8½" in interlocked heating chamber, Input—220 Volts, 60 cycle single phase $1,200.00

3 KW "Scientific Electric" Dielectric Heating Unit, Model SE-3A, Serial 1242, 20-30 Megacycles complete with tubes and timing equipment, etc. Electrodes—6½"x8½" in interlocked heating chamber. Input voltage—220 volts, 60 cycles single phase $900.00

This equipment was made in U. S. A. and is practically unused having become redundant owing to changes in process. Prices quoted can be subject to negotiation.

Prices F. O. B. Edmonton

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150 ton straight side, back geared Stahl press, 5½ inch adjustable stroke, double crank. Base approximately 31 inches square, open face. Write for details and price.

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- PLANERS
- PRESSES
- SHAPERS
- MISCELLANEOUS

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LATHE—Engine, Mackintosh-Hemphill, 72"/110"x30' Centers (1943)
CRANE—150 Ton x30' span, Whiting, Bridge, plus 2 Aux. Hooks 25 ton (will widen to any span).
CRANE—Shepherd 3 Ton x 30' Span Floor Control.

BORING MILLS—D & H 3½" horiz. floor Vertical Turret Lathe, 30'
Bullard 72", 2 swivel heads on rail (old)

HYDROHONER—Model H4 Micromatic

DRILL PRESSES—Minster #2D, 2½" cap. Hvy.
Snyder, 1½", 28" swing

GEAR SHAPERS (2)—Fellows #6

FURNACE CONVEYOR—72"x24"x34' Electric & gas at 900° F.

LATHES—Engine, Logan, g.c., 10"x4' cabinet Engine, L & S 16"x30" C Geared Head Turret, Foster #1B Universal, Chucker

MILLERS—Cinci. Hydromatic #4-36 Late
Newton Vert. 42" Rotary Hvy.
Cinc. #3 Vert. Hi Power
Br. & Sh. #3 Universal
Cinc. #08 Vert. (late)

PUNCH—Sq. end, Smith 1-1/16" thru ⅝"

ROLLS, Angle—Bertsch 3"x3"x⅜"

ROLLS, Bending—H. & J. 30'x¾", Pyr.
Southwark 15'x3", Vert.

SHEARS—Square—Famco Power 36"x18g (new)
Square—Pexto 10' x 10 g. (1943)
Alligator—(#2) 24" blade, 3" Rds.
Rotary—Quickwork #50A, 48"x¾" (late)

SPOT WELDER—75 KVA Federal

THREAD MILLS—Morey 12"x10' Centers (late)
Lees-Bradner 9"x36" centers

THREADER—Bolt—Acme 2½" cap.

PRESSES—Z & H #7, 50 ton percussion
Bliss #78½, 450 ton, 18" stroke

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One Power Driven Slip Roller
4½"x62" Practically New, $1100.00

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Roll-forming machines and Roller Dies
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12'x¼" DREIS & KRUMP. AC MOTOR DRIVE.

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TYPE V-2 LaPOINTE 3-WAY HYDRAULIC VERTICAL BROACH, 10 TON, 48" STROKE, NEW IN 1948

NO. 30 FOSDICK JIG BORER, 18" x 36" TABLE, NEW IN 1946

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9/16" Model RA-6 ACME-GRIDLEY Threading
5½" 4-Spindle CLEVELAND Model "A" Chuckers (2)
No. 412 NEW BRITAIN-GRIDLEY, 5½" collet capacity, 4-Spindle, 2nd Operation
No. 5D POTTER & JOHNSTON, 5 face turret, 1936, hardened ways (2)

GRINDERS

6"x18" THOMPSON Hydraulic Surface, 1942 & 1946 (2)
No. 72A HEALD Internal, 15000 Serial, cross sliding head, 3 motors
No. 72A3 HEALD Gagematic Internal, 2 motors
Model A-3-12 and A-3-16 ARTER Rotary
No. 25A HEALD Rotary, 30" chuck
No. 4S FELLOWS Helical Cutter Sharpener
12"x36" CINCINNATI Universal, 1943
No. 2 REID Surface, hand and power feed, 1943
No. 111 VAN NORMAN 24"x84" Crankshaft, 1946
No. D-85 NORTON Crankshaft, Old
CARBOLOY Carbide, double end, 10" wheels, adjustable tables
No. 1½ ABRASIVE Surface, hand feed
4"x12" LANDIS Model "H" hydraulic infeed
No. 16A Dual BLANCHARD, 43" diameter Plain table
Extra 30 H.P. Head for No. 18 BLANCHARD, New
No. 13 BROWN & SHARPE Tool & Cutter, Serial No. 4992
No. 221 HANCHETT Double Opposed Disc Grinder, two 20 H.P. motors, 24" dia. discs

MISCELLANEOUS

45 Ton GIDDINGS & LEWIS Horizontal Boring Mill, 5" bar, 1935
No. 12E GISHOLT Vertical Static Balancer, 1946
No. 2K KEARNEY & TRECKER Horizontal Mill, with built-in 24" dia. rotary table only

SEND US YOUR INQUIRIES!

INTERNATIONAL MACHINERY COMPANY

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LATE TYPE MACHINE TOOLS

CINCINNATI 34-36 HYDRAUMATIC MILL with 360 degree tracing attachment. Spindle speeds to 2020 RPM—Used 3 months.

Norton 10x48 Semi-Automatic Cylindrical Grinder

Norton 6x30 Semi-Automatic Cylindrical Grinder

American 27 inch by 10' CC Engine Lathe, 11 inch hollow spindle, with chucks and T.A.

Brown & Sharpe #12 Automatic Mill, 18 inch table travel

THE MACDELL COMPANY

1042 W. LAKE STREET, CHICAGO 7, ILL. MONROE 6-7715

GRINDERS

Blanchard No. 16. Cincinnati O. D., Size 12 x 72.

72A3 Heald Gaugematics.

ARNOLD HUGHES CO.
765 PENOBSCOT BLDG.
DETROIT, MICH.—WO-1-1894

4" bar G. & L. #340T Hor. Mill Table Type 48" high, 24" long, table 39"x72", 1943.
3½" & 4" bar Landis Floor Type Mills
BL-2416 Keller 3 dim., 3 spin., Late
36-90 Cinci. Duplex Hydro Miller, 1942
#1404 K. & T. Simplex Miller, 48" travel
No. 4 Kempsmith Vert. Miller, Timken, M. in base
No. 3 Cinci. Dial Vertical Miller, Late
No. 2M Cinci. Vertical Miller, 1942
No. 4B G. & S. Plain Miller, Late, M. in base, Timken
No. 2 Standard K. & T. Pl. Miller, M. in base, Timken
No. 2LU Van Norman Univ. Miller, '42
5'14" sol. American Trip. Purp. Radial, AC M.D.
5'12" sol. American Trip. Purp. Radial, M. on arm
Barnes Combo. Boring & Honing Mach. up to 10" bore x 8" hole, 1942
48"x20'6" con. Simmons Lathe, 1942
48"x26' con. Amer. Lathe, 2 carr., 2 T.A., Late
36"x26' con. Niles, 2 carr., 1 T.A., AC
32"x25' con. Sommerfeld, 2 T.A., 2 carr., 1942
22'-24⅝"x48" con. Skoda Lathe, NEW
14'-10½"x34" con. Bradford Lathe, T.A., 1943
14'-10½"x30" con. L. & S. Lathe, T.A. '43
12"x30" con. Pratt Whitney Model B La., '43, NEW
21" Cinci. Acme Univ. Brass Lathe, 1940
20" Libby "C" Turret 4½" capty
16" Gemco Univ. Shaper, '43, like new
No. 2G Morey Univ. Turret La., NEW

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This equipment was made in U. S. A. and is practically unused having become redundant owing to changes in process. Prices quoted can be subject to negotiation.

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PUNCH PRESSES

#PG-6 Ferracute
#36 Toledo
#6 Bliss, double action
#18-S Cleveland, S.S., S.C.
#77½ Bliss, S.S., S.C.
#DDG-4 Ferracute
#14 Toledo Horn
#62 Bliss
#C-22 Ferracute
#1½ Bliss O.B.I.
#1 Toledo O.B.I.
#2 Toledo O.B.I.
#5 L & J O.B.I.

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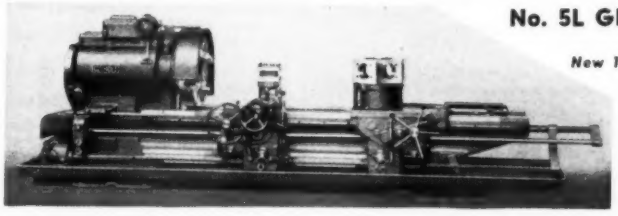

No. 5L GISHOLT TURRET LATHE

New 1945, Hydraulic preselector head, quick change gearbox, full length leadscrew, hydraulic bar feed, 28"-3 jaw chuck, 32" 4 jaw chuck, 12" hole in spindle, 36" swing, 50 HP AC motor. Inspect under power at Buffalo.

12/18½" x 30" MONARCH Model CKK Lathe, new July, 1944

28" x 20' bed BERTRAM Heavy Duty Boring Lathe, rapid traverse, 12 speed Timken head, heavy duty steady rest, 20HP motor in base, new 1942

30" x 12' centers NILES "Timesaver" Lathe, new 1942, power rapid traverse, 20HP motor

No. 2 SIMMONS Micro-Speed Turret Lathe, with tooling, new 1943

No. 7D JONES & LAMSON Turret Lathe, with flat turret, preselector head, hardened ways, 15" air chuck

Model 60 NEW BRITAIN, 1"—6 spindle Automatic, with threading spindle

Model R-14 SENECA FALLS Lo-Swing Lathe, front and rear carriages, hardened ways, automatic timing, 30HP AC motor

No. 6A POTTER & JOHNSON Automatic Chucking Machine, Timken spindle, hard ways, Skinner air chuck, factory rebuilt 1939

No. 7 Fellows High Speed Gear Shaper, new 1944

No. 7 GLEASON Revex Rougher, for bevel gears, new May, 1943

No. 186 GARDNER Disc Grinder, 36" diameter, 15HP AC motor, new 1943

No. 3V REED PRENTICE Vertical Milling Machine, spindle speeds to 2000 RPM, power feeds

No. 2 NORTON Universal Tool & Cutter Grinder, 1943

1½" to 8" JARECKI Heavy Duty Pipe Machine, new 1943

4" bar FOOT-BURT Table Type Horizontal Boring Mill, vertical range 53", horizontal range 84", 1942

No. 3V REED PRENTICE High Speed Vertical Milling Machine, 8 spindle speeds to 2000 RPM, power feeds

O'CONNELL MACHINERY CO.

1825 NIAGARA ST. BEdford 8500 BUFFALO 7, N. Y.

THE FOLLOWING IS ONLY A SMALL PART OF OUR EXTENSIVE STOCK

LATHES

1—Hendey 12"-14½"x30"c. g.b., 18 spds., 1195 rpm, M.B., T.A., collets, chucks, T.B. age 1942

1—Hendey 12"-14"x30"c., geared head, 24 speed, 1195 rpm, M.B., chucks, Timken Bearings, age 1942.

1—Lodge & Shipley 14"-16½" geared head, 12 speed, 1060 rpm, M.B., Timken Bearings, T.A., chuck, Mfg. stops, age 1942.

MILLING MACHINES

Brown & Sharpe #3A, M.B., P.R.T., table 57½x 13"

2—Nichols Hand Millers, late

1—Cinn. #08 Rise & Fall, late

1—#2M Producto Hand Miller, late

GRINDERS

Gallmeyer & Livingston #4 Univ. T&C, completely equipped, age 1944

Landis 6"x30" Hydr. cylindrical Grinder

Rivett #104 Internal Grinder, age 1943

TURRET LATHES

3—Simmons #2B Turret Lathes, 1¼" collet, 1½" chuck, late

1—Gardner 3-D Double End Polishing Lathe complete with dust collector and back shaft for belt sander M.D. Latest type.

Send us your inquiries. Send us your surplus list

Green Brothers of Worcester, Inc.
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2L GISHOLT TURRET LATHE, 1940
6" P & W VERTICAL SHAPER
#2 CINCINNATI VERT. MILL, 1941
1A W & S TURRET LATHE, #345.019
#5 B & O UNIV. TURRET LATHE, #14063
#2 W & S TURRET LATHE, 1941
#2-18 CINCINNATI AUTO. MILL, 1942
16"x54" SIDNEY 16sp. LATHE, 1943
#2H MILWAUKEE PLAIN MILL, 1941
#3 CINCINNATI HSDT MILL, 1941
HARDINGE VERTICAL MILL, 1941
#3V VAN NORMAN VERT. MILL, 1942
12"x54" LEBLOND LATHE, 1943
12"x30" HENDEY LATHE, 1940
½" WICKMAN AUTOMATIC, 1943
6' CIN-BICKFORD RADIAL
#5 FOSTER UNIV. TURRET LATHE, '36
21" FOSDICK SS GEARED DRILL
1L GISHOLT UNIV. TURRET LATHE
#44 EXCELLO CARBIDE GRINDER, 1942
72A3 HEALD INTERNAL GRINDER, 1941
#6 MARVEL HACK SAW, 1943
7R ROCKFORD OBI GEARED PRESS
36" BULLARD NEW ERA VTL
STERLING UNIV. T & C GRINDER, 1944
8½x8" GOSS & DELEEUW CHUCKER
#212 CAMPBELL WET CUTOFF SAW, 1945
KO LEE UNIV. T & C GRINDER, 1942

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LATEST TYPE LIKE NEW

Reed Prentice No. 5 Jig Borer

Pratt & Whitney Keller Type "G"

Norton 6"x30" Cyl. Grinder, Hydr. Table & Wheel Head Traverse

H & W 10"x48" Thread Miller

Cleveland Models "A" & "B" Automatics

Conomatic 1¼"—8 Spindle Automatics

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Unusual opportunity to procure modern Fellows Gear Shapers 6154 and 645 as well as 12" Gleason Generators, 36 BM Gould & Eberhardt Rougher, #7 Fellows Gear Shaper, #16 D. E. Whiton Machine. Write for full information.

FS-1633, AMERICAN MACHINIST
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16"x34" Le Blond Heavy Duty Automatic Lathe (1941)
No. 31 Excello Precision Thread Grinder (1941)
H-2 Barnes Hydram Drill, 2" cap. in steel (1937)
306-H Barnes Vertical Hydraulic Hone (1942)

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U. S. Hand Mill, M.D.
Foote-Burt 3-way Special Drill.
National-Acme 9/16" Model RAG Auto.
Morrison Auto. Elect. Soldering Furnace.

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HEADLINERS

LATHES

14"x30" centers Lodge & Shipley Selec. Grd. Hd., MD
14"x78" centers Lodge & Shipley Selec. Grd. Hd., MD, taper
16"x32" centers Sidney Grd. Hd., MD
17"x50" centers LeBlond H.D., MD
19"x60" centers LeBlond H.D. 12-speed Grd. Hd., MIB, taper
19 3/8"x13 ft. centers LeBlond Slid. Bed Gap Lathe, MD, grd. hd.
20"x94" centers American H.D. Grd. Hd., MD
24"x72" centers Bridgeford, Cullman MD
24"x112" centers Lodge & Shipley, Turner MD
30"x127" centers Lodge & Shipley, cone
36"x270" centers Lodge & Shipley rip. Grd. 18-speed Selec. Grd. Hd., two carriages, taper, MD

MILLING MACHINES

No. 2 Cincinnati H.P. Plain, MD
No. 2 Cincinnati Universal, cone
No. 2 Cincinnati H.P. Rect. O.A. Plain, MIB, Timken
No. 2B Milwaukee Plain, DOA, MD
No. 2B Milwaukee Universal, DOA, MD
No. 3 Cincinnati H.P. Plain, MD
No. 3B Milwaukee Universal, MD
No. 4 Cincinnati H.P. Universal, MD
No. 4 Cincinnati H.P. Vertical, SPD

SHAPERS

20" Gould & Eberhardt H.D., cone
21" Smith & Mills B.G., cone
24" Gould & Eberhardt H.D., cone
28" Gould & Eberhardt H.D., Western MD

PLANERS

28"x28"x6' Cincinnati, M.D. box table
30"x30"x18' Whitcomb, MD
36"x36"x18' Gray, MD
42"x42"x10' Niles-Bement-Pond, MD box table
42"x42"x14' Niles-Bement-Pond, MD, box table
72"x60"x14' Cleveland Openside, DC rev. MD, AC MG set

DRILLS

No. 4 Fosdick 5-spindle, MD
No. 2 Colburn Hvy Duty Manufacturing
No. 3 Avey H.D., MD
21" & 24" Cincinnati-Bickford Slid. Hd., MD

RADIAL DRILLS

2½' Cincinnati-Bickford, MD factory gearbox
4' Mueller, SPD factory gearbox
7' Dreses, AC MD, factory gearbox

GRINDERS

TG-636 Jones & Lamson Thread Grinder, new 1943
No. 3 Abrasive Surface, 8"x22"
No. 2 Diamond Surface, 12"x36"
10"x18" Norton Type C, MD, new 1943
No. 4A Landis Crankshaft, MD, offthrow heads

GEAR MACHINERY

No. 1 Adams Hobber
No. 34 Brown & Sharpe Hobber, MIB
32"x16" Cincinnati Hobber, MD
No. 4 Cincinnati Cutter, MD
No. 4—36" Brown & Sharpe Cutter
No. 6—60" Brown & Sharpe Cutter, MD
No. 6 Fellows Shaper

BORING MILLS

36" Bullard "New Era" Vert. Turret Lathe
36" Rogers Model IT Vert. Turret Lathe, New 1941
48" Gisholt Vert. Boring Mill
No. 3A Universal Horiz., 3" bar, SPD

MISCELLANEOUS

150 ton Caldwell Hydraulic Wheel Press, MD
400 ton Niles-Bement-Pond Hydraulic Wheel Press, MD
Jackson (Melling Northrup) Die Sinker, cherrying attachment
10" Pratt & Whitney Vertical Shaper
No. 1 Baker Keyseater, MD
No. 4 Mitts & Merrill Keyseater, MD
No. 1 Garvin Tapper
No. 3 CAM Haskins Tapper, MD
2" Landis Pipe Machine
6" Cox Pipe Machine, MD
¾" Landis Bolt Threader, MD, leadscrew
1½" Acme Class "A" Bolt Threader, MD
1½" Landis 2-spindle Bolt Threader
2½" Landis Long Bed Bolt Threader, leadscrew
No. 6A Marvel Hvy Duty Power Hack Saw, MD, automatic feed, new 1943
9" x 8" Ingersoll-Rand ER-1 Air Compressor, MD

Many other machines in stock. Send us your inquiries.

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Three minutes from the Cincinnati hotel district

EVERY ITEM GUARANTEED
All Late Type

54" Bullard Vert. Turret Lathes, latest type
5" Sellers Horiz. Boring Mill, floor type
10'x12' floor plate, latest type
2½" Bar Giddings & Lewis Horizontal Boring Mills
100" King Vertical Boring Mill, latest type

40"x15' LeBlond Engine Lathe, latest type
37" swing x 39' between centers Niles Lathe, latest type
28"x120" Monarch Lathe, latest type
Bullard Multaumatics 12" type D
#28/60 Cincinnati Hydrotel, Sgl. Spindle, with hand controls (2)
9/16", 2¼" RA6 Acme Gridley Auto.
24" & 36" Gould & Eberhardt Shaper
60" Bickford Vertical Boring Mill
75 Ton Henry & Wright Dieing Press

#2A, #3A, #4A Warner & Swasey Turret Lathes, latest type with taper attachment, all built 43 and later.

Cone Automatic, 2¼", 3½", 1½", 4 & 6 spdl. late
Hanchett Surf. Grinder, 86"x18", 22" wheel, late
Planers, 48x48x10' Cinn. Dbl. Housing

#1½ Yoder Roll Former, 8 Spdl, 1½" shaft dia. x 6½" Max. length flat strip, latest

Drill, Barnes deep hole, Horiz. 2 Spdl, latest
Broach, #5-42 and #25-48 duplex ram Surf, Broaches, late
Prod. Lathe Sundstrand #12, late
Prod. Lathe, #R-14 Lo-swing, late
Horiz. Mill #5 Cincinnati, latest

PAULS MACHINERY COMPANY
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Phone: TYLER 7-6300

HORIZONTAL BORING MACHINE
W. F. & John Barnes, Single End, with two spindles, Model #416, Serial No. 416-313, Head Travel 78", Center Dis. Between Spindles 7¾", Boring Bar Size 3½".
EXCELLENT CONDITION
WINSTON MACHINERY COMPANY, INC.
517 S. Delaware St., Indianapolis 4, Indiana

BOREMATIC—Heald #49 Double End
BORING MACHINE—Krueger 6-Sta.
DRILL—Natco B4B 46-Spindles
DRILL HEADS—XLLO, Natco, Etc.
DRILL—Leland Gifford 3-Spindle
DRILL, RAIL—Leland Gifford 2-Sp.
GEAR CUTTER—G & E 50" Regular
GEAR LAPPERS—Fellows 8LS
GRINDER—B & S #5 CYL. 3"x18"
GRINDER—Cinci. 6"x18" Model EA
GRINDER—Norton 6"x30" Semi-Auto.
GRINDER—Landis 10"x36" Plunge
GRINDER—Heald #22 Rot. Surf. 12"
GRINDER—Heald #81 Int. Chucking
GRINDERS—Milwaukee Face Mill "C"
GRINDER, THREAD—J & L Int. 6"x3"
LATHE—Sundstrand 8" Auto. Stub
LATHE—L & S 24"x80" Ctrs. QCG
LATHE, TURRET—W & S #2 Electric
SCREW MACHINE—Cone 1⅞" 8-Sp.
THREAD ROLLER—Watson Flagg 2½"

BRM MACHINERY CORP.
28 Edison Place
Newark 2, New Jersey

27" x 72" Le Blond Heavy Duty Lathe, new in 1942.
No. 4 Cincinnati Hi-Power Vertical Miller, late.
No. 2 B. & S. "Light Type" univ. Miller, complete, 1946.
12" Morey Vertical Shaper, like new, 1943.
No. 4 Kling Punch, 48" throat, Arch. jaw., ¾" x ¾".
No. 8 Marvel Bandsaw, 18" x 18", new in 1942.
C-13 Natco Multiple Spl. Drill, 32 Spls. #1MT.
No. 4 Cincinnati Centerless Grinder.
No. 73 Heald Airplane Cylinder Internal Grinder, 1943.
No. B-20 Arter 20" Rotary Surface Grinder, 1941.

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• LONG LATHES •

4—36"x228" centers AMERICAN High-Duty 12 Speed Geared Head Engine Lathes; new in 1942; 2 carriages, full length forming attachment, power rapid traverse, large and small face plates, 2 steady rests and 25 HP 3 phase motor each.

1—24"x216" centers AMERICAN High-Duty 12 Speed Geared Head Engine Lathe; new in 1942; 2 carriages, full length forming attachment, large and small face plates, 2 steady rests and 20 HP 3 phase motor.

All fully rebuilt and guaranteed. Original photographs upon request.

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If any machine guaranteed by us does not prove satisfactory mechanically, the purchaser may return it freight prepaid within 30 days and we will refund the purchase price in full.

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Billings & Spencer, 2 sp. Dimatic Cutoff, 1½" capacity
Cone Automatic, 8¾", 5 spdle. chucker
3" Cleveland 4 spdle., Model G

DRILLS

No. 2 Allen, 4 spindle, #2 MT Late
No. 1B Avey, Single spindle, HO 28" sw.
Model 30 HO Baker, Inverted Type
Model 42-30 Bodine, 12 sta. Drill Tapper
No. D-4 Colburn, 3½" cap.
20" Foote-Burt, single spindle, High Duty
Hammond Jack Knife Radial
Natco, 14 spindle, #1 MT
#5 Foote-Burt rail, 6 spindle

GRINDERS

No. 16 Bryant Internal
10 x 36" Cincinnati EA Cyl.
No. 91A Covel Tool & Cutter
No. 900 Hanchett Face
No. 2 Norton Tool & Cutter
No. 76RA Rogers Knife
No. 10G Sellers Drill
Model 80 U.S. Disc
10x18" Landis, plunge cut
14" x 72" Hill-Clarke Norton Pl. Cyl.
No. 72 Heald Internal

MILLERS

Betts 2-spindle Profiler
Milling Head for No. 2 Cincinnati
No. 2 Kempsmith Plain
35/60 Cinc. Hydromatic, duplex
Sundstrand Duplex Rigidmill Model 22 type A

BORING MILL

No. 35 Landis, 3½" bar, floor type
36" Bullard
42" King Vertical
3" Lambert, table type, horiz.
5" bar Sellers table type horiz.
Simplex 2U hydraulic

LATHES

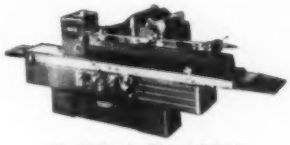
LeBlond Multicut Production
36"x22' LeBlond, Lima Drive
12"x18" Lipe-Carbo, semi-automatic
8"x108" LoSwing, 25 HP AC motor
J&L Fay Automatic 8x21"
#16ML LeBlond Automatic Production

TURRET LATHES

#4A Warner & Swasey
No. 2L Gisholt 16" 15 HP, AC
No. 6 Warner & Swasey

GEAR MACHINERY

Gleason 3" Straight Bevel Gear Cutter
Gleason No. 17 Hypoid Gear Grinder
Red Ring Model GLL 15" Lapper
Fellows Model 71A
Fellows Model 7A
Fellows Model 61A



No. 50 Excello Thread Grinder

PLANERS

12'x14'x36' bed Mesta
30"x30"x8' Gray

PRESSES

Farquhar 75 ton Hyd. Forming, 48" str.
Warco OBI, 50 ton, 4" stroke

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ONE OF THE LARGEST LATE TYPE STOCKS IN THE MIDDLE WEST READY FOR IMMEDIATE DELIVERY

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Horiz. & Vert.
84" Niles-Bement-Pond Vertical Boring Mill Spd.
84" Gisholt Vert. Boring Mill Spd.
120" Niles-Bement-Pond Vert. Boring Mill Spd.
No. 45 G&L Horiz. Boring Bar 5" Cap.-Spd

PUNCH PRESS

300-Ton Cleveland Toggle Press, 58"x58" Bolster, MD
300-Ton Hamilton SS Punch Press, Model 3013½, 8" Strk., 26x30 Bolster, M.D.
135-Ton Verson SS All Steel Punch Press, 30" x 30" x 6" Stroke, M.D.

GRINDERS

10x36 Cincinnati Hydraulic Cyl. Grinder, W. Reciprocating Hd.
12 x 45" J&L Thread Grinder
14" x 72" Norton Hyd. Cyl. Grinder, Type C

LATHES

50" x 300" Ctrs. LeBlond Gh. Engine Lathe QCG Actual Swing 42½", 27 Spds. 1.5 to 165 RPM, Complete W/Steadyrest, Face Plate, Compound Rest. M.D. Standard A.C.

12" x 24" Faye Auto. Lathe. W Cross Slides & Tail Stock
16" x 102" Ctrs. Monarch GH Lathe, Actual Swing 20½", T.A. Compl.
16" x 102" Ctrs. American Pacemaker GH Lathe, Compl. 18½" Actual Swing
27½" x 120" Ctrs. LeBlond GH Heavy Duty Lathe, Compl., T.A.
36" x 360" Ctrs. Bridgeford GH Lathe, T.A. M.D. A.C.
42" x 192" Ctrs. Bridgeford GH Lathe, M.D. A.C.
42" x 300" Ctrs. Bridgeford GH Lathe, M.D. A.C.
44" x 216" Ctrs. Houston-Stanwood & Gamble GH Lathe, QCG, M.D.
54" x 216" Ctrs. Houston-Stanwood & Gamble GH Lathe, QCG, M.D.
60" x 240" Ctrs. Houston-Stanwood & Gamble GH Lathe, QCG, M.D.

MILLING MACHINES

No. 2-24 Cincinnati Plain Hydromatic Mill.
No. 34-36 Cincinnati Plain Hydromatic Mill. W/Tracer Attach.
No. 4-48 Cincinnati Hydromatic Mill.
No. 56-90 Cincinnati Hydromatic Mill.
No. 33 Sundstrand Production Mill., 14 x 48" Cap.

RADIAL DRILLS

4' x 13" Col. Carlton M.O.A. Radial Drill AC
3' x 11" Col. Carlton Motor on Arm Radial Drill AC
4' x 11" Col. American Triple Purpose Motor on Arm Radial Drill AC
5' x 13" Col. Carlton Motor on Arm, D.C. Control
5' x 15" Col. Carlton Motor on Arm, A.C.
6' x 17" Col. American Hole Wizard Motor on Arm, A.C. Controls

FABRICATING EQUIPMENT

No. 33 U.S. Multislide Wire Mach. M.D.
8' x 16 GA. D & K Power Shear
8' x 12 GA. Dual No. 40-8 Power Press Brake, M.D.
8' x 10 GA. D & K Power Apron Brake, M.D.

36"x36"x12' NILES-BEMENT-POND PLANER Equip. W/Box Table. Direct Connected DC Motor W/Controls. 2 Rail Heads, 1 Side Head. R.P.T.

MANDEL-CAMRAS MACHINERY CO., INC.
710-716 W. WASHINGTON BLVD., CHICAGO 6, ILLINOIS

McDONALD
USED MACHINERY

Baush 44" Hvy. Duty Vert. Boring Mill, 2 Hds.
Bullard 36" New Era Vert. Turret Lathe with side head
Hilles & Jones 2" Cap. Guillotine Shear
Brown & Sharpe No. 2 High Speed Vert. Miller, 1942
American 4' Exc. Head Radial Drill 12" col.
Dill 18" Str. A.C. M.D. Vert. Slotter adj. head
G & L and Universal 3" Bar Horiz. Boring Mills
20" All Grd. Camel Back Drill
Cin-Bick 3' & Morris 3½' Arm Radial Drills
Blanchard M.D. Vert. Sp. Surface Grinder 26" chuck
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B & S No. 2-A & 3-A, Mill, No. 2-B, Cin. No. 1-M, Cin. No. 2 Grd. Hd. Univ. Millers
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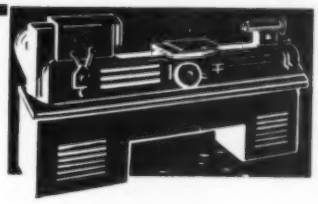

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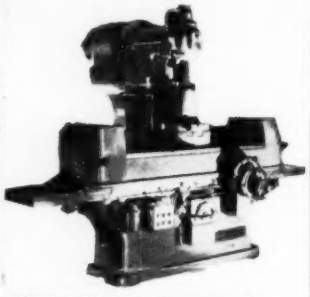

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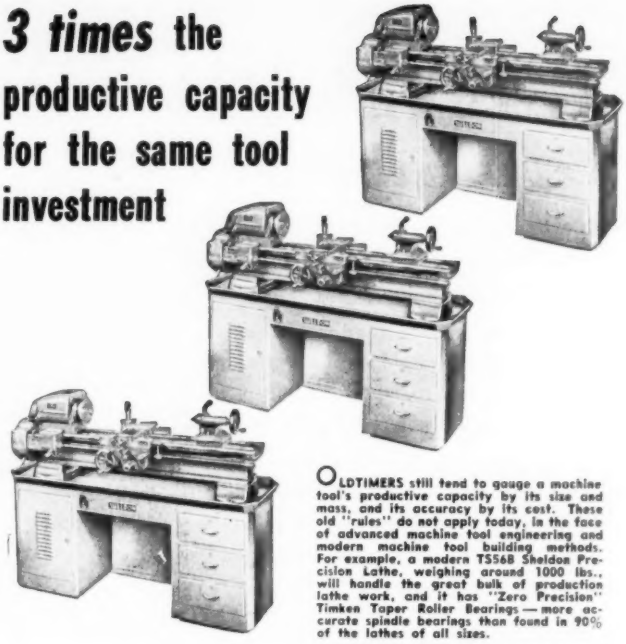

OLDTIMERS still tend to gauge a machine tool's productive capacity by its size and mass, and its accuracy by its cost. These old "rules" do not apply today, in the face of advanced machine tool engineering and modern machine tool building methods. For example, a modern T5568 Sheldon Precision Lathe, weighing around 1000 lbs., will handle the great bulk of production lathe work, and it has "Zero Precision" Timken Taper Roller Bearings — more accurate spindle bearings than found in 90% of the lathes of all sizes.

By scientific distribution of metal (rather than sheer mass) these new machine tools have rigidity and stamina not always obtained in more cumbersome machine tools. Lighter, handier and easier to run, they can be safely operated by the less experienced —by whatever operators available.

Produced in numbers, in a specially built and tooled plant, Sheldon Precision Machine Tools are low in price. Today for the cost of a single older type tool you can have 2, 3, or even 4 SHELDON units . . . can put 2, 3, or 4 operators to work . . . can double or triple your productive capacity for the same machine tool investment.

Let us show you how.

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CHICAGO

SHELDON MACHINE CO., Inc., 4234 N. Knox Avenue, Chicago 41, Illinois

Only MARVEL *builds all four**

While it is true there are several builders of hack sawing machines and many builders of band sawing machines, only MARVEL builds *BOTH* hack saws and band saws. The fact is that MARVEL manufactures 35 models of 10 basic types of metal sawing machines which include the world's fastest automatic production saw, the world's largest giant hydraulic hack saws, the world's most versatile band saw and the most widely used small shop saws.

With intimate and broad field experience in all types of metal cutting-off equipment and 35 different saws available, it is obvious that MARVEL Field Engineers occupy a unique and exclusive position in the industry. They are eminently qualified to make expert and *unbiased* recommendations covering the type, size and model of metal sawing equipment best suited to individual requirements—the most efficient, most accurate, fastest, broadest in scope and the most economical.

MARVEL is also the only manufacturer of both metal sawing *machines* and metal sawing *blades*. Because the efficiencies of both the machine and the blades are interdependent, each upon the capability of the other, expert knowledge covering both saws and saw blades is essential to the proper appraisal of any specific sawing situation. Correct balance of cutting speed and blade life, feed pressure and blade tension are all potent factors in over-all performance. Here again it is the MARVEL Field Engineer who is qualified to provide the comprehensive answer to your question. His job is to help you saw metal most efficiently—his services are available upon request—gratis.

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BLOOMINGDALE AVE., CHICAGO 39, U.S.A.

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***BAND SAWING MACHINES**
***BAND SAW BLADES**
***HACK SAW BLADES**

4

MARVEL Metal Cutting SAWS
No. 9A Marvel Hack Saw
No. 3 Marvel Band Saw
MARVEL High-Speed-Edge HACK SAW BLADE
MARVEL Metal-Cutting BAND SAW BLADE

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Tool room types — production types

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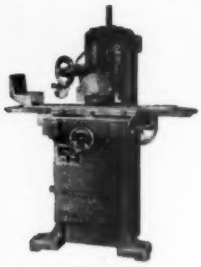
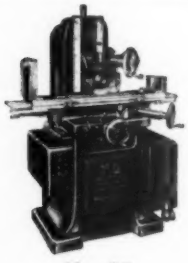
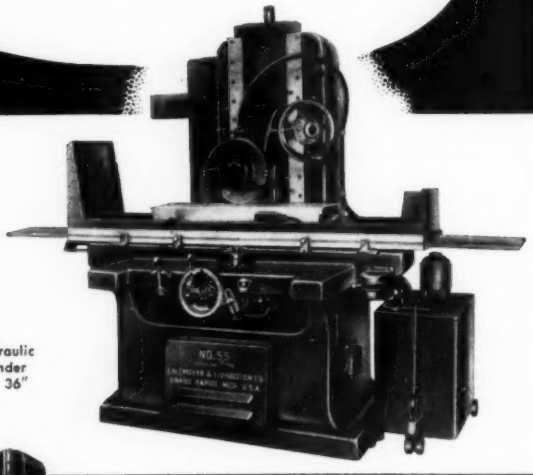


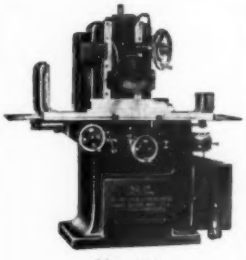
No. 20
Grand Rapids Hand Feed Surface Grinder
Size 6" x 10" x 18"



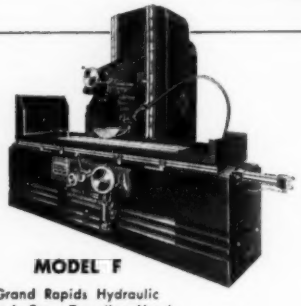
No. 25
Grand Rapids Hydraulic Feed Surface Grinder
Size 6" x 10" x 18"



No. 55
Grand Rapids Hydraulic Feed Surface Grinder
Size 12" x 17" x 36"

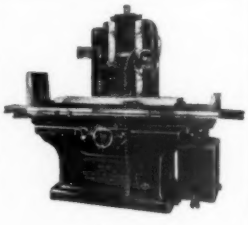


No. 35
Grand Rapids Hydraulic Feed Surface Grinder
Size 8" x 12" x 24"



MODEL F
Grand Rapids Hydraulic Feed, Cross Traveling Head Surface Grinder
Size 16" x 25" x 48" to 24" x 25" x 96"

GRAND RAPIDS GRINDERS



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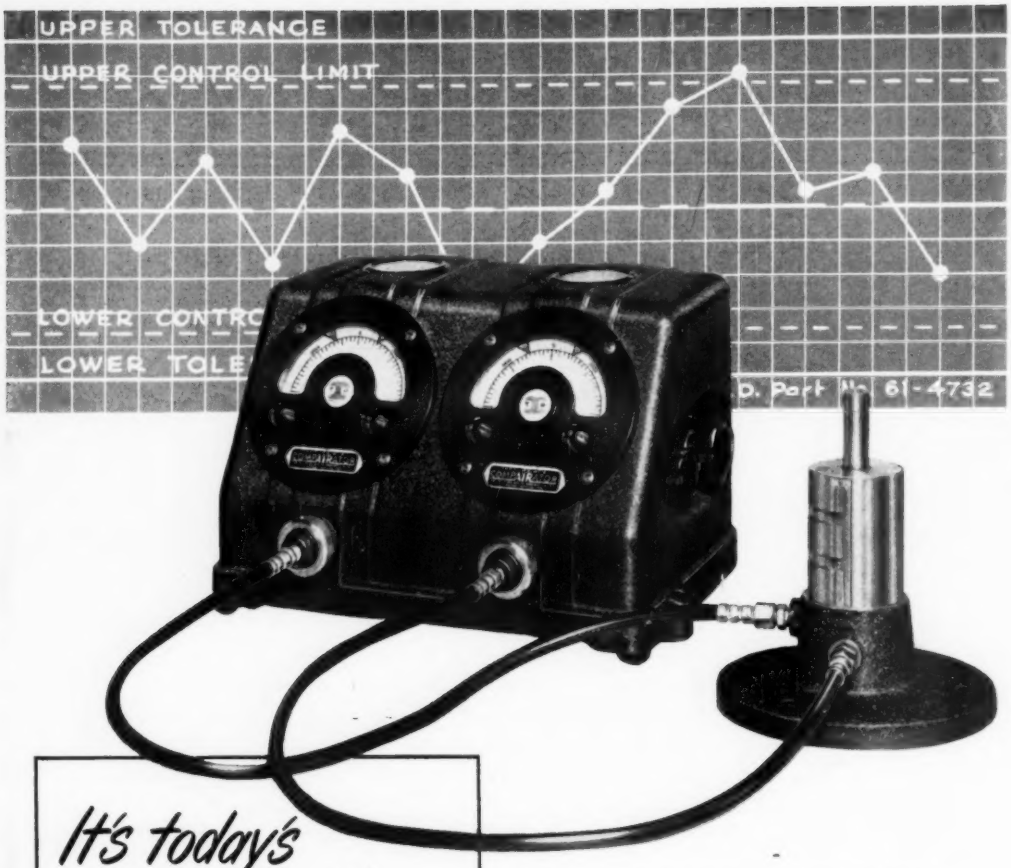

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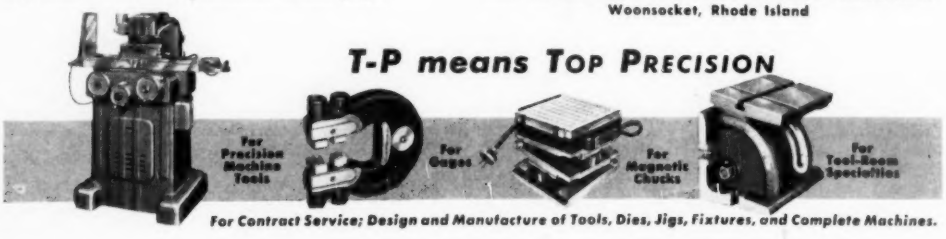

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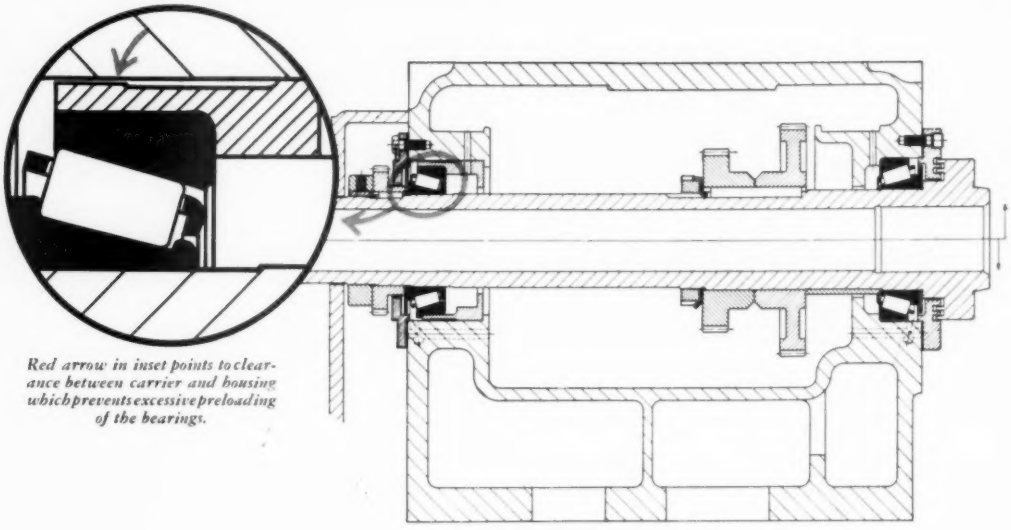

Red arrow in inset points to clearance between carrier and housing which prevents excessive preloading of the bearings.

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